CONSUMER PRODUCT CLASS KNOWLEDGE: A TYPOLOGY AND IMPACT ON INFORMATION SEARCH AND EVALUATION

By

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To Nandini, Vijith and Viraj

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CONSUMER PRODUCT CLASS KNOWLEDGE: A TYPOLOGY AND IMPACT ON INFORMATION SEARCH AND EVALUATION

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Consumers' product class knowledge is believed to significantly influence search, evaluation and choice. Past research typically examined its role in aggregate terms (e.g., high versus low familiarity). The current research takes a disaggregate view, examining the specific functions and use of different types of knowledge. Secondary effects on confidence are also examined. Further, knowledge structure and factors like involvement and time pressure may affect the functions.

A taxonomy of consumer product class knowledge is proposed, consisting of: (1) terminology, (2) brand-attribute values, (3) attribute range knowledge, (4) inter-attribute correlations, (5) summary brand evaluation, (6) summary attribute importance and (7) usage situation. The research then focuses on attribute range knowledge and inter-attribute correlations.

Attribute range knowledge may serve as a context in forming preliminary evaluations of brand-attribute information and these may mediate sequential search patterns. Secondary effects on confidence are proposed.

In an experiment involving choice of an SLR camera, three levels of range knowledge (wide, narrow and no range information) were crossed with seven brand-attribute locations. Subjects lacking range knowledge avoided extreme evaluations, searched by attribute and had lower confidence in evaluations. The width of the range did not affect evaluations. When range was known, brand-based search was more frequent for favorable brand-attribute values.

Next, consumers may use inter-attribute correlations to make inferences about a product's attribute values, and attain parsimony in information search. Only one of a pair of correlated attributes may be searched, particularly under high time pressure or low involvement. Such reduced search may lead to different evaluations, choices and lowered confidence.

The proposed study manipulates knowledge of inter-attribute correlation, time pressure and task involvement in choosing a stereo receiver. Subjects can sequentially search a computerized information base, obtaining brand-attribute information flexibly. The values are configured so that subjects using correlational knowledge to search parsimoniously are likely to choose inferior brands and have lower confidence.

In summary, the dissertation presents a taxonomy of consumer product class knowledge, and empirically examines the advantages of the disaggregate approach. Implications of the findings and future research are discussed.

CHAPTER 1
INTRODUCTION

It is generally well-accepted that the knowledge that a consumer possesses about a product class is likely to guide search, evaluation and choice behavior in many significant ways. This rather simple proposition can be illustrated using some examples of how a consumer may be influenced by different types of knowledge that may be available in the environment. Moreover, a formal review of the literatures in marketing, consumer research, psychology and economics shows many significant investigations documenting that prior product knowledge has important moderating influences on search, evaluation and choice.

It is the purpose of this dissertation to further investigate the nature of these influences. In particular, this dissertation postulates and empirically explores the impact of specific types of product knowledge on consumer information processing in choice. This introductory chapter will motivate the topic and give an overview of the dissertation.

Knowledge Effects in the Consumer Environment

We begin by developing some examples of how knowledge might guide a consumer's search, evaluation and choice behavior. Consider a consumer who wants to buy a single lens reflex (SLR) camera. This consumer may use different types of knowledge in the course of this choice task. For example, in searching for information about cameras, a buyer may encounter terms like shutter speed, lens aperture and motor drive. If the consumer can understand this terminology based on prior knowledge, it is more likely that he or she will be able to interpret the information that is available about these features of an SLR camera. Hence, the consumer may search more for this type of information.

Another person may know (perhaps based on a conversation with a photographer friend) that "Nikon cameras are very good." Such knowledge of an overall evaluation of a brand may be seen as an adequate basis for making a choice. Other brands may not be examined, and even if more detailed brand-attribute information is available about Nikon, this information may not be searched.

Over and beyond these effects on search, prior knowledge may also guide evaluations. Thus a previously-experienced camera user may rate Nikon cameras as generally very good. This overall evaluation may be retrieved and applied when evaluating a new Nikon model. Thus, the knowledge of an earlier brand evaluation can affect a subsequent evaluation.

As another example of how knowledge may affect evaluations, consider a consumer who knows that camera warranties range from 6 to 18 months. Given this range of attribute values, a model having an 18 month warranty may be evaluated as the best available on that attribute and searched further on other attributes. Another model that offers a 6-month warranty may receive an unfavorable evaluation and not be examined further.

Finally, we might consider the possibility that the choices consumers make may also be affected by their knowledge. Consider a consumer who examines the advertisements of mail-order firms and finds that these firms sell the same merchandise cheaper than regular camera stores. Based on this perceived correlation between type of store and price, he or she may examine alternatives in a camera store, yet buy through mail-order, even though there may be risks associated with not having inspected the specific camera that is purchased.

As another example of how knowledge of certain kinds of inter-attribute correlation may guide choice, consider a camera-buyer who associates high prices with better lens quality. This consumer may buy an expensive brand even though he or she has no way of testing the performance of camera lenses. Thus, the choice of a specific brand may be guided by the use of a general associative rule or a piece of knowledge retrieved from memory.

Knowledge Research in Marketing

While the preceding examples are anecdotal, many research papers in the marketing literature have developed the general theme that knowledge about a product class affects search, evaluation and choice.

For example, most of the traditional models of buyer behavior have postulated relationships between knowledge and search. Thus, it has been argued that a consumer who is unfamiliar with a product class may search extensively for information, first identifying the attributes to search and identifying criterion levels to use in evaluating brands on those attributes (Bettman 1979). For familiar product classes, there may be less search, and it may involve finding out about the brands (Howard and Sheth 1969). The amount of search is likely to be low if information about the product class and brand alternatives is already known (Bettman 1979). Hence, depending on the level of familiarity, both the nature and extent of search may differ.

Knowledge is also known to affect consumers' evaluations and brand choices in a product category. Of the brands known to a consumer, a few form the evoked set, and are actually considered before making a choice. The consumer may be predisposed towards some brands, i.e. some may be favored over others. According to Howard and Sheth (1969), the tendency to be predisposed is higher as product class experience increases. The inexperienced consumer may examine different brands and try to evaluate all of them. With a moderate degree of familiarity, fewer brands may be actively evaluated. When familiarity is high, the consumer may favor a small set of brands and only these may be considered.

The manner in which brands are evaluated may also differ with familiarity. Inexperienced consumers may try to construct choice rules when the brand(s) are encountered. With experience, these choice rules may be well-learned and recalled and used subsequently.

Over time, consumers may form attitudes towards commonly encountered brands. The traditional marketing literature provides a rich base of research evidence that these attitudes play a key role in choices (Fishbein and Ajzen 1975). In summary, therefore, the marketing literature has traditionally emphasized that the way consumers search for information, evaluate brands and make choices depends on their knowledge about the product class.

Knowledge Research in Psychology

Many studies in the psychology literature examine how knowledge of a domain may affect information processing about that domain. The level of domain knowledge is found to produce qualitative differences in the way information is processed.

One proposition that seems to be well-accepted is that a person who knows relatively little about a specific domain may find it difficult to encode new information about that domain. For example, in a study of chess players, Chase and Simon (1973) find that masters are better than novices at recalling game arrangements. The authors proposed that greater knowledge of chess may enable masters to see specific game patterns in the arrangements of the pieces and lead to an advantage in encoding new information.

Prior knowledge may enable a person to determine appropriate courses of action when placed in different situations. For example, the set of relevant attributes of a product may vary across different usage situations. A consumer who has greater knowledge of these differences is more likely to selectively seek information on the specific attributes appropriate for a situation. Thus, if a camera is to be used to take action pictures of a sports event, a consumer may want a motor drive that winds the film rapidly. If it is to be used to take portraits, the consumer may want a camera that uses larger sized film, to get better detail. Thus, knowledge of desirable benefits in specific situations and how specific attributes relate to these benefits helps the consumer search and select the right camera.

In a conceptual paper, Larkin et al. (1980) compare strategies that might be employed by experts and novices in solving physics problems. They suggest that the expert may work through whole sequences of steps that are known to be relevant. In contrast, the novice may perform one step at a time, and check each step before going on to the next. They conclude that a more knowledgeable person may be able to process information more efficiently and faster than a less knowledgeable one. Given a problem (that requires search and evaluation), the former may go towards the solution of a problem while the latter may do incremental checking and rechecking.

In summary, the literature in psychology has developed and tested several propositions about how a person's level of domain knowledge may affect the manner in which he or she subsequently processes related information. It seems fairly clear that these propositions have a great deal of relevance in examining the role of product class knowledge in consumers' search, evaluation and choice.

Knowledge Research in Economics

Stigler (1961) developed one of the best-known propositions about consumer search in the economics literature. He argues that it pays the consumer to search for information as long as the marginal gains of doing so exceed the marginal costs. The consumer seeks the lowest price and is assumed to rely on knowledge of the distribution of prices and quality, and the costs of search in order to search optimally.

This theory of search has been used in a number of applications, most notably to analyze market equilibria from the firm's point of view and to examine the search behavior of job seekers. It has been applied to a lesser degree to the search behavior of consumers in more conventional product choice situations.

In a conceptual paper, Wilde (1980a) argues that search behavior should vary for different underlying distributions of prices and quality. In an empirical study, Meyer (1982) models how consumers update their expectations and perceptions about a candidate set of apartments during sequential information search. The probability of inspecting an alternative increased monotonically with its riskless value and the variability associated with attributes. Hence, according to this literature, consumers rely on their knowledge of variability of attributes during information search.

In the economics literature, there is an implicit theory of knowledge, although consumers are assumed to rely on their knowledge of a few things--prices, quality and search costs. In fact, Nelson's (1976) classification of "search" and "experience" goods is based on implicit assumptions of homogeneity in consumer knowledge about certain product categories. However, such views are perhaps somewhat limited and ignore the rich variability in consumer knowledge across product categories and between individuals. Acknowledging this, Dohan (1976) points out that prices are only one of many types of information the buyer may wish to obtain from the seller. Wilde (1980b) recognizes that the models are restrictive, ignoring other types of information sought, types of search and how factors like time pressure may affect search behavior. Nevertheless,the implication is quite clear, consumers' prior knowledge guides their subsequent search for information.

Secondary Effects of Knowledge

The research undertaken here will focus on prepurchase search, evaluation and choice. Working through these mechanisms, one can see that knowledge may alter information processing and thus have secondary effects on variables such as recall and recognition and on the confidence with which an evaluation is held.

Secondary effects of knowledge have been found in empirical work in marketing and in psychology. For example, subjects familiar with stereos are better able to recall complex ideas presented in a stimulus ad for a stereo (Alba 1983). Johnson and Russo (1984) find that the amount of information recalled about automobiles shows a task x familiarity interaction. When subjects perform a judgment task, recall increases with product familiarity. But when they perform a choice task, the amount of information recalled is an inverted-U shaped function of product familiarity. Less information is recalled when familiarity is low or high, while more information is recalled when product familiarity is at a moderate level.

Several other studies also establish similar secondary effects of knowledge on recall and recognition. Thus, subjects with a great deal of knowledge of baseball better recall and recognize information that they have previously learnt about the game (Chiesi, Spilich and Voss 1979). In another study (Fiske, Kinder and Larter 1982), subjects who know more about political systems are better able to recall information inconsistent with what they know.

Finally, Park and Lessig (1981) have conducted a study examining how consumers with differing levels of familiarity with microwave ovens made choices among brands. They find that the subjects who are more familiar with microwave ovens have greater confidence in their choices.

In summary, even a preliminary review of the literature reveals that product class knowledge may have significant impact on consumer search, evaluation and choice in a product category. Moreover, the evidence also suggests that via these effects, knowledge may also have contingent impact on the recall and recognition of product information, and on the confidence associated with the specific choices that are made. The basic purpose of this dissertation is to develop a conceptual framework within which some of these effects may be analyzed and empirically examined. The next section overviews the dissertation.

Overview of the Dissertation

Chapter 2 presents a literature review that forms the basis for the conceptual framework proposed in this dissertation. It is argued that even though it is well-accepted that consumer knowledge of a product class can affect information search, evaluation and choice, past research in this area is limited. This is because the role of knowledge has typically been studied only at an aggregate level, making only the coarsest of discriminations such as high versus low knowledge. In fact, knowledge consists of many different types that can play very different roles in information processing. Since past research generally ignores this very basic point, a central proposition of this dissertation is that consumer product class knowledge should be viewed in disaggregate terms. Different types of consumer knowledge of a product class can then be studied in terms of their functions in search, evaluation and choice.

The conceptual framework proposed in Chapter 3 therefore takes a disaggregate view of consumer product class knowledge. It develops a taxonomy of this knowledge and proposes explicit links between the different types of knowledge identified in this taxonomy and their role in consumers' search, evaluation and choice processes. Also, while it is not a central feature of the empirical parts of the research, the framework recognizes that the structure or organization of knowledge in memory may moderate how certain information processing functions are performed.

As an example, a consumer whose knowledge of camera brands is structured in evaluative categories such as good and bad cameras may search the good brands selectively but not consider the "bad" brands at all, even when the underlying attribute information base may not be complete or even accurate.

As a second example, a consumer may know that for a particular usage situation, one brand is better than another (e.g. "For action pictures, Nikon is better than Yashica"). When situational appropriateness is organized by brand, only the favored brand may be searched. Now suppose a person knows that for a particular usage situation, one attribute is more important than another (e.g. "For portraits it is preferable to use cameras that use larger film"). When situational appropriateness is organized in terms of attributes, different brands may be searched on the relevant attribute.

As a third and final example of the moderating effects of knowledge structure, what a consumer knows of the terminology associated with a product class may be divided into those terms that are basic and others which are advanced. Consider a person considering purchase of a stereo. If the consumer knows only basic terminology, he or she may only check how powerful a stereo system is, and how much it costs. Salespersons may be asked for advice and recommendations. On the other hand, if a consumer knows the more advanced terminology, that person may search on attributes like wow and flutter, Dolby noise reduction and total harmonic distortion. This person may be comfortable comparing technical data, and examining reports in audio magazines. Thus, search and evaluation activities may be performed differently, depending on how knowledge is structured.

The functions of knowledge may also be moderated by other background factors such as search costs, consumer involvement levels and time pressure. Some of these factors appear in the studies that will be reviewed in the next chapter.

For example, consider a consumer trying to choose among a large number of brands. If the consumer knows that two attributes are correlated, he or she may rely on this correlation knowledge and examine only one attribute out of the correlated pair. This effect may be accentuated when search costs are high or when there is time pressure. Thus, in a situation where the consumer is aware of the existence of a correlation between, say, the wattage and fidelity ratings of stereos, he or she may obtain information only about wattage and thus cut down the amount of search effort expended.

Thus, in summary, the taxonomy described in Chapter 3 identifies seven different types of consumer knowledge about a product class and develops the role that each may play in different consumer choice scenarios. This chapter also identifies potential secondary effects on recall, recognition and confidence. Where appropriate, the moderating effects of knowledge structure and other background factors are proposed.

The effects of two types of knowledge in the above taxonomy are explored empirically in this dissertation. The first of these is consumers' knowledge of the range of values available on an attribute or "attribute range knowledge." Chapter 4 reviews the literature and develops a scenario that is used to explore the likely effects of attribute range knowledge on search and evaluation.

Chapter 5 presents an empirical study of the effects of attribute range knowledge. A mechanism is proposed in which attribute range knowledge affects the preliminary evaluation of a given piece of brand-attribute information. This provisional evaluation then mediates further search. Competing explanations of these effects are tested in the context of a camera choice task. Secondary effects on confidence are also investigated.

Chapter 6 presents the findings of the empirical study of range knowledge. It then discusses the gains made from the disaggregate conceptualization and the empirical investigation of range knowledge that formed the fundamental basis of this research. Theoretical, managerial and public policy issues are discussed in the light of the findings.

A second type of product class knowledge, that of inter-attribute correlations, is examined in Chapter 7. Scenarios are developed where it is proposed that a consumer may use knowledge of inter-attribute correlations to economize on effort expended in information search. This may affect what information is acquired, and in turn may affect evaluation and choice. Formal hypotheses are presented in this regard. Chapter 8 describes the design of an experiment in which these hypotheses are tested in the context of a stereo choice task. The actual conduct of this study is outside the scope of this dissertation. However, the study design specifically points to the establishment of a future research program. Chapter 9 reviews the dissertation, summarizes the findings and discusses the contribution of this work and the expected directions for future research.

CHAPTER 2
LITERATURE REVIEW

The central idea proposed in the previous chapter is that consumers have different types of knowledge that may impact on information search, evaluation and choice. In addition, these effects on how information is processed may have further secondary effects on recall, recognition and confidence in evaluations.

This chapter will review the literature relating to consumer knowledge, and in doing so, set the stage for the formal conceptual framework to be presented in Chapter 3. We begin by emphasizing that consumer knowledge may be studied with a focus on its learning and storage in memory, or its activation and retrieval from memory, or how it is used in specific consumer tasks. We first establish that this dissertation has the last mentioned focus. We next discuss some definitions of consumer knowledge and familiarity available in the literature. This is followed by a detailed review of research which has studied knowledge in aggregate terms. Two aspects are discussed: (a) effects on search and evaluation in a choice context, and (b) the secondary effects on recall, recognition and confidence.

Following this discussion of aggregate views of consumer knowledge, we turn to work that has taken a disaggregate view. Some specific typologies of consumer knowledge that appear in the literature are discussed. This part is also structured as before: first examining effects on search and evaluation in choice, and then looking at secondary effects on recall, recognition and confidence.

Approaches to Studying Consumer Knowledge

As we have mentioned earlier, consumer knowledge may be studied with a focus on its learning and storage in memory, on activation and retrieval from memory or on how it is used in specific consumer tasks. The first of these approaches is important as it indicates how consumer cognitions develop. In this domain one may examine issues such as covariation assessment--to what extent can a consumer detect and learn the presence of a relationship between two attributes of a brand in a product category (e.g. Bettman, John and Scott 1986; John, Scott and Bettman 1986). While studies of this type are being conducted in the marketing literature, this dissertation does not focus on these issues.

Studies of consumer knowledge can also focus on the activation and retrieval of product category information in memory. These studies typically focus on how encoding and retrieval factors operate during consumer judgment and choice tasks.

It is fairly well known in the psychology literature that encouraging attention to stimuli and elaboration during encoding improves recall. For example, if processing of information is "deeper" (Craik and Lockhart 1972), or a person is required to think about an object in relation to himself (Tulving and Pearlstone 1966), recall is likely to be higher.

Retrieval factors also affect memory accessiblity. For example, according to the principle of "encoding specificity" (Tulving and Thomson 1973), cues available during retrieval are more likely to be helpful for recall if they are the same cues as those available during encoding.

Consumer researchers have extended the study of memory accessibility to product decision tasks as well. Johnson and Russo (1978) have studied memory for product information. They find that overall evaluations of products are remembered better than intermediate stages of choice processes and brand attribute information. Alba and Chattopadhyay (1985) have studied the impact of presenting a subset of brands on recall of the remaining brands in a product category. The authors find that when brands are undifferentiated, giving subjects such a subset inhibits recall of other brands. When brands are perceived as being differentiated, part-category cues may inhibit recall, or else serve as cues to other subcategories and thereby enhance recall of other brands.

Biehal and Chakravarti (1982, 1983, 1986) find that the format and goals under which information is learned affects how it is retrieved and used in subsequent choice tasks. Brand information learned in directed fashion is easily retrieved, whereas brand information learned incidental to choice is relatively less accessible in memory. These differences in memory accessibility of product information impact on subsequent evaluation and choice processes.

While activation and retrieval issues are critical aspects of the study of consumer knowledge, the research in this dissertation focuses less on its retrieval, and more on how specific types of knowledge are used in consumer tasks. Thus, rather than focus on the conditions under which attribute value ranges or inter-attribute correlations are learned or retrieved from memory, we focus on how these types of knowledge are used in the consumer decision process, assuming that this knowledge is learned and retrieved or is otherwise made available in the course of a consumer task.

Prior Definitions and Measures

In consumer research, product class knowledge has been thought of in many different ways. Most of these conceptualizations are concerned with the total amount of knowledge, and do not distinguish between different types of knowledge. Also, the terms familiarity and knowledge have been used interchangeably. A review of these different definitions in the literature suggests a lack of consensus about exactly how product class knowledge might be conceptualized.

Johnson and Russo (1984) view "product familiarity" and knowledge of a product class as synonymous ideas. They are interested in examining whether different amounts of knowledge affect new information acquisition in consumer choice and judgment tasks. While they acknowledge that knowledge can come from different sources, including direct experience (purchasing and using a product) or indirectly (from advertising or word-of-mouth), they do not distinguish between types of knowledge. Knowledge levels are measured by subjects' self-assessments of familiarity with the product category.

Marks and Olson (1981) define familiarity as "consumers' cognitive structures for a product (presumably caused by various product-related experiences)." As conceptualized, these cognitive structures include representations of brands, attributes, usage situations, product evaluation and choice rules. Even though the definition allows for different types of knowledge, acquired from different sources, these authors measure familiarity at an overall level, by obtaining self-reports of product usage experience, or frequency of use. The typology of knowledge is not explored further.

The individual's subjective perceptions, i.e. how much a person thinks he or she knows is used by Biehal (1983) as a definition of product class knowledge. Similar ideas are developed in defining subjective knowledge (Brucks 1985) and subjective familiarity (Park and Lessig 1981). These authors explore propositions suggesting that a lack of confidence in one's knowledge may motivate a person to search more for information. These studies also use self-assessments of knowledge/familiarity as the primary measurement approach.

Raju and Reilly (1979) view familiarity in terms of "frequency of use, overall familiarity and knowledge of how to select the best brand." Their definition covers usage experience, the total amount of knowledge and a specific type of knowledge (i.e. how to select the best brand). Once again, their empirical work uses self-assessments of familiarity/knowledge as measures.

The above review points up the lack of a clear consensus regarding how product knowledge is best operationalized and also shows a clear lack of attention to the development of a taxonomy of knowledge. The only paper that has gone to the trouble of developing a taxonomy is one by Brucks (1985), who lays out one classification scheme for different types of product knowledge and uses both free response and structured questionnaires to measure what subjects actually know. This paper is reviewed more fully later.

Aggregate Product Familiarity: Effects on Search, Evaluation and Choice

The predominant view of familiarity or product class knowledge in the existing literature is at an aggregate level. The entire knowledge set that an individual has about the product class leads to a feeling of "being familiar" with the product class.

The consumer's sense of "being familiar" is typically assessed by obtaining self-ratings of the level of familiarity. The specific content of what the consumer knows is not considered. Thus, two individuals may indicate they have a high degree of familiarity with the product class of cameras. But they may differ considerably in what they actually know and how that knowledge was acquired. One person may know a great deal about the technical features of cameras, having used many brands for taking different kinds of pictures. Another person may know about prices, warranty terms and overall assessments of different brands, having sought information about cameras in stores, from independent sources or from friends. Clearly, it is important to distinguish between what these two individuals know because these differences in the type of knowledge that they possess will most likely lead them to buy cameras in very different ways.

In the next section we will review a body of the knowledge literature wherein these distinctions are not made and product class knowledge is viewed in the aggregate. While one objective of this review is to establish the findings of this research, the review will also serve to identify the critical areas of limitations of this research.

The available literature suggests that the level of knowledge has effects on the amount of information sought, as well as on specific patterns of information seeking. Also, there is some evidence for a link between knowledge and choice behavior. Thus, Bettman and Park (1980) examine how consumers' prior knowledge and experience and the phase of the choice affect (a) the types of information used, and (b) the kinds of choice processing that occurs. They hypothesize that subjects with low and high familiarity rely more heavily on prior information, instead of processing currently available information. Those with low familiarity may not be able to process new information since they lack the basic knowledge necessary to make sense of the new material. This is more likely when the product class is relatively complex.

High familiarity subjects are not motivated to process new information, being able to rely on what they already know. By contrast, subjects with moderate familiarity are more likely to process new information, since they are able to use their prior knowledge to assimilate the information. They are also more motivated to seek new information.

The authors also expect that the degree of attribute processing is negatively related to degree of prior knowledge, i.e., attribute processing decreases and brand processing increases as knowledge increases. Since most of a consumer's common product-related experience occurs in a brand-organized external environment, this may facilitate brand processing as contrasted with attribute processing.

The authors use self ratings of search, usage and ownership of microwave ovens to screen subjects into low, moderate and high familiarity groups. Subjects are given a brand x attribute matrix and perform two tasks. First, in an elimination task, they select those brands that are acceptable to them. Then, subjects choose the brand they most prefer from the set of acceptable brands.

Reliance on prior information is highest for low and high familiarity subjects, suggesting that these subjects search less for new information. The amount of attribute-wise processing is lower for experienced consumers.These results show that the way in which consumers search and evaluate alternatives may depend on familiarity.

Johnson and Russo (1984) examine whether familiarity affects the ability to learn new information in choice and judgment contexts. This study uses automobiles as the product class. Subjects are given a brand x attribute matrix and asked to rate each alternative (judgment task) or choose one from the set (choice task). After completing the assigned task, they provide a self-assessment of their previous knowledge of automobiles, and their usage experience with the product class. Subjects are then asked to recall information they were given and any other judgments or comparisons they made during the task. The amount of information recalled is used as a measure of search.

The researchers propose that the more familiar subjects may have an encoding advantage during the judgment task. They are able to encode new information more efficiently and this may increase search. They find that in the judgment task, there is a monotonic increase in the amount recalled by subjects. The authors also propose that more familiar subjects do not acquire redundant information about existing products. They pay selective attention to relevant information and ignore irrelevant information. In the choice task, they expect subjects to ignore some information, and thus reduce search as familiarity increases. The amount of information recalled is expected to be an inverted-U shaped function of familiarity. When familiarity is low, in the choice task, recall is expected to increase, consistent with an "enrichment" mechanism (i.e. increasing familiarity facilitates learning) rather than with the "selectivity" mechanism. In any case, the authors find that the amount of information recalled shows an inverted-U shaped function of familiarity in the choice task.

Using only an aggregate conceptualization of knowledge, it is difficult to nail down the explicit causes of the findings. Consider a prospective camera buyer who is familiar with the meaning of terms like aperture size, motor drive etc. This consumer may be able to make better sense of information available about these attributes (i.e. have an encoding advantage) and may search more brands on that attribute, compared to a consumer who does not know the meaning of these technical terms. A consumer who knows that picture quality depends mainly on the lens quality of the camera may look for ratings of lenses in photo magazines and not pay much attention to brands which have features like microchips that tell (!) the user when it is okay to take a picture. Knowing attribute importance enables this consumer to be more selective during search. This is consistent with prior findings that search is significantly lower for less important attributes (Biehal and Chakravarti 1986).

Thus, even though it is plausible that certain types of knowledge may give the consumer an encoding advantage or lead to selectivity in information processing, it is not possible to verify any of these effects directly in aggregate studies such as Johnson and Russo (1984). Conceptually, some types of knowledge may increase search, whereas others may attenuate it. In any case, the point remains that there is much to be gained from adopting a disaggregate view of knowledge and linking each identified type of product class knowledge to its function in consumer tasks.

Several other studies conduct similar aggregate analyses of knowledge effects. Moore and Lehmann (1980) study the pattern of information seeking for a non-durable product (bread). For each of six weeks, subjects acquired information on, chose and consumed one of five brands of bread. They were questioned about familiarity with types of bread, importance of attributes, similarities of different types of breads etc., in order to evaluate knowledge or what may be loosely termed "experience." The effects on external search of a number of different types of variables, (e.g. situational variables, potential payoff/product importance, knowledge and experience, and other individual differences) are studied. The knowledge/experience-related variables account for more of the variance in search than any of the other types.

The authors also make a distinction between experience acquired prior to the experiment versus during the experiment. Prior experience is measured in terms of (a) experience with the bakery, (b) self reported nutrition knowledge and (c) shopping behavior for the brand.

External search during the experiment is hypothesized to be negatively related to experience prior to the experiment. Information acquisition is found to be related to two measures of prior experience, self reported nutrition knowledge and shopping behavior, but unrelated to experience with the bakery. Experience during the experiment is measured in terms of the number of previous purchases made in the experiment. External search is expected to be negatively related to the number of previous purchases, and this is supported by the data.

Taken together, the findings of this study suggest that knowledge/experience is an important predictor of external search, and that more experience leads to lower information acquisition for non-durable products. Yet, despite this important general statement, the study is unable to pin down the specific effects of different types of knowledge of a product category.

In another study of information seeking, Biehal (1983) examines the impact of prior experience and individual differences on search for auto repair services. If previous experience is high, the consumer may search more for information available internally, i.e. in memory, and there is less need to search for external information. The data are from a survey of households that had incurred at least one major auto repair expense in the preceding 12 months.

The independent variable of interest is the consumer's perception of the extent of prior knowledge about auto repairs. To measure memory search, respondents are asked to indicate the extent to which they thought about their prior auto repair experiences. External search is measured in terms of number of phone calls to repair companies, number of visits to repair companies and the number of friends from whom information is sought. Prior information is found to be positively correlated with internal search and negatively correlated with external search.

The effects of price and brand familiarity on brand preferences are discussed by Monroe (1976). Subjects categorized their own experiences with three products, coffee, fabric softener and spray cologne. Subjects were placed in one of three cognitive levels (of familiarity), taking into account purchase and usage experience. Subjects compared two brands, as the price of one was varied. When subjects had previous purchase and use experience, that experiential information dominated price as a factor in choice.

In summary, previous consumer research has established that the aggregate level of knowledge of a product class is related to information search and evaluation in a choice context. However, relatively little has been documented about the specific impacts of different types of knowledge in a product category on the different dependent variables analyzed in these studies.

Aggregate Knowledge: Effects on Search, Evaluation and Choice

Two studies in psychology explicitly link the aggregate amount of knowledge to some functions which knowledge might serve. The first links a higher level of knowledge to an increased ability to encode new information. The second suggests that experts may be more efficient in processing information. Both should be considered untested hypotheses, even if highly plausible ones, about the functions of knowledge at the aggregate level.

Chase and Simon (1973) sought to isolate and define the "chunks" into which information is supposedly encoded in chess perception tasks. In a perceptual task, subjects have a chessboard in view and reconstruct positions onto another board. Chess masters and novices do not differ in performance on this task. In a second task, an arrangement of pieces is observed briefly and then reconstructed from memory. Recall for masters is no different from that for novices when the pieces are arranged randomly. But masters have superior recall for game arrangements. The authors propose that chess masters may have an advantage in encoding game arrangements, enabling them to recall those better than novices. While an encoding advantage is one plausible explanation, it is also possible that masters do not recall the arrangements they observe in the experiment, but only reconstruct previously learned arrangements after categorizing the presented arrangement via an encoding heuristic that labels it as a previously learned game pattern. If this were true, the encoding "advantage" may indeed turn to a disadvantage whereby a criterially similar game arrangement is labelled erroneously. The ensuing reconstruction may well be erroneous in retrieving differences of detail between the presented and the "encoded" arrangement.

Larkin et al. (1980) propose that task performance of experts may differ from that of novices, with the experts using more efficient problem-solving strategies. For example, experts may have available a set of condition-action pairings for the domain of interest. Given a specific condition, they may be able to identify the appropriate action to take. This may enable experts to work more efficiently and with less effort expended when solving problems in that domain.

If greater knowledge helps subjects encode new information about a domain or work more efficiently, consumers having greater knowledge of a product class may behave differently from those who have less. A consumer may translate knowledge of a usage situation to assess what kind of product performance or attribute specifications will be appropriate. This may reduce the effort expended in searching for information. For example, an audiophile may examine high quality stereo equipment for use only in a situation where acoustics are good. He or she may advise a novice to consider only cheaper compact stereos for use in a small apartment.

The above two studies explicitly consider the functions that knowledge may serve in information processing. In another study, Miyake and Norman (1979) examine whether knowledge is a pre-requisite for asking questions about a new topic. The subjects in this study differ in their level of knowledge of a text-editor, and are learning more about that domain. Trained subjects ask more questions when material is hard, while novices ask more questions when it is easy.

The extent of question asking can be thought of as an expression of information search behavior. In the consumer context, people with more knowledge may search more when the externally available information matches their current level of knowledge about a product class. The results also suggest that extent of search in a product category may be correlated with comprehension of the relevant terminology for the description of products in that category.

Aggregate Product Familiarity Studies: Secondary Effects

As knowledge affects search, evaluation and choice, it affects how both old and new information is processed. As a consequence, knowledge may have secondary effects on recall, recognition and confidence derived from evaluations. These mediated effects are often of considerable interest in consumer choice situations.

Two studies in the marketing literature suggest that consumers' level of knowledge may be positively related to the accuracy and amount of information recalled, following search and evaluation. In the first of these studies, Moore and Lehmann (1980) find that knowledge is related to search behavior and choice. While they do not explicitly hypothesize this, the authors suggest that search and choice may be linked to aided recall. Correct recall of attributes is positively related to the amount of external search on that attribute, and also to the stated importance of an attribute. For a high-knowledge consumer, there is less need to search for external information. However, if an important attribute is searched, recall is likely to be higher.

Moore and Lehmann also find that brand recall accuracy is more highly related to purchases of a brand within the experiment, than to the acquisition of information about the brand. This is understandable if one considers that it may not be particularly useful to retain brand-specific information for a brand that is merely examined but not purchased. On the other hand, if the brand is chosen, additional, as well as richer, processing of its information is more likely and should improve recall. These arguments are consistent with other empirical studies that find that chosen brand information is remembered better than information about rejected brands (Biehal and Chakravarti 1982).

In a second study of this issue, Alba (1983) has examined whether the extent of knowledge is related to product information recall. Subjects' self-assessments of knowledge about stereos are used to separate them into high vs. low knowledge groups. He finds that subjects who are familiar with the product are better able to recall complex ideas presented in a relatively technical stimulus advertisement. These subjects also evaluate the advertisement as being more useful. These findings suggest that relative to unfamiliar subjects, familiar subjects may better comprehend ads with complex information. Thus they may find such ads more useful.

The Alba (1983) study also shows that the product is rated more favorably by subjects with lower knowledge. More familiar subjects may be able to understand the implications of the attribute levels and evaluate the brand accordingly. Less familiar subjects may not understand the attributes and may give the brand a higher rating than if they are able to understand the attribute levels. Even though other results suggest the likelihood of evaluation being lowered by lack of understanding or uncertainty, both types of results point to secondary effects of knowledge.

In the psychology literature, a large body of work examines how the level of knowledge may affect subjects recall and recognition. Typically, more knowledgeable subjects demonstrate better recall and recognition of new information about the domain.

Chiesi, Spilich and Voss (1979) find that subjects with higher knowledge about baseball have better recall and recognition of new information given to them about the game. Morris, Gruneberg, Sykes and Merrick (1981) find a high correlation between subjects' performance on a questionnaire of knowledge about soccer, and their recall of scores, immediately following broadcast. In contrast, subjects in a control group show a low correlation between general knowledge of soccer and the number of correct predictions made. The authors suggest that experimental subjects could not have guessed correctly. Rather, the more knowledgeable subjects may have greater interest in the scores, and encode the new information more effectively.

In the domain of political knowledge, Fiske, Kinder and Larter (1983) examine knowledge-based strategies in processing information, as a function of expertise. Expert subjects (i.e. those who had higher levels of knowledge about political systems) are better able to recall information inconsistent with their prior knowledge.

Tyler and Voss (1982) compare how prior factual knowledge and attitudes affect recall and recognition in text processing. Subjects are tested for determining their level of factual items. Knowledge is distinguished from attitudes, which are measured using a test with affective items. Cued recall and recognition are correlated with the factual items when new information given is incongruent with subjects' expectations. The correlation is higher with the affective items when the information given is congruent with expectations. Thus knowledge of factual and affective items about a topic is related to recall and recognition of new information about that topic.

In studies of recognition memory, Arkes and Freedman (1984) compare performance of experts and non-experts. A quiz on baseball knowledge is used to separate subjects into high and low scoring groups. For another topic, knowledge of Ohio geography, local students are deemed experts while those from a western campus are the non-experts. Recognition is higher for experts as contrasted with non-experts. But this relationship holds only when the distractor items on the recognition test are not related to the targets. When the distractor items are related to the targets, expert subjects are less likely to correctly recognize items seen previously, compared to non-experts. One might argue that on such tests experts may encode a stimulus on the basis of their prior knowledge and subsequently may "dump" pre-learned information they have about the topic in memory, rather than actually recalling the presented material. A similar argument is made about the Chase and Simon (1973) findings reported earlier.

In summary, there is evidence in the literature that higher levels of knowledge are associated with better recall and recognition of information. If consumers are more familiar with a product class, they may more easily recall information about brands inspected in the past. Having been exposed to advertising, they may more easily recognize brands in-store. Knowledgeable subjects' ability to recall and recognise information may enable them to use such information in the choice context. However, as before, these aggregate studies of knowledge or familiarity effects do not provide the necessary insights into the mechanisms underlying these relationships. We will next argue that disaggregate views of knowledge begin to take important steps in this direction.

Disaggregate Studies of Knowledge: Effects on Search, Evaluation and Choice

In contrast to the preceding aggregate conceptualizations, a disaggregate conceptualization of knowledge involves the identification of different types of knowledge within a domain. A particular type of knowledge can be conceptually linked to a role or function that it can serve in search, evaluation and choice. This conceptual linkage can then be studied empirically.

For example, a camera buyer may have knowledge about the range of available brand values on an attribute, the correlation between two features, or the overall evaluations of the available brands. For each of these types of product category knowledge, one may specify particular functions. Thus, for example, knowledge of inter-attribute correlations can be used to reduce search effort, attribute range knowledge may provide a basis for the provisional evaluation of a piece of brand-attribute information and so on. Moreover, the role that a given type of knowledge plays may differ depending on the specific scenario or the aspect of consumer choice tasks being studied.

Some recent articles have tried to develop typologies of consumer product class knowledge. These articles are important precursors of the work in this dissertation. To set the stage for our own conceptual framework, we will next review these papers. We will focus first on those studies that directly examine effects on search, evaluation and choice. Thereafter, we will examine the reported secondary effects on recall, recognition and confidence in evaluations.

Punj and Staelin (1983) propose a descriptive model of information search and test it using data from a survey of auto buyers. Self-ratings of the amount of knowledge are obtained. Two types of knowledge are identified. Usable Prior Information is operationalized as the specific knowledge of models and dealers. Prior Memory Structure is defined as the consumer's knowledge of cars in general.

The study examines the impact of these two dimensions of knowledge on the amount and nature of the external information and the time spent searching for information. The authors hypothesize that external search is negatively related to Usable Prior Information. Thus, a person who knows about available models and the process of buying a car has little need for external information search about models as the expected benefits of search are limited. This hypothesis is supported by the data.

External search is hypothesized to be positively related to general product class knowledge. A consumer who knows a lot about autos in general may be better able to comprehend new information. This may increase search. Thus, the experienced auto buyer who knows about construction of engines, types of carburetors and types of suspensions may search more for information about these aspects than the novice. However, the authors do not find empirical support for this propositon.

Russo and Johnson (1980) develop a hierarchical taxonomy of product knowledge. They use this taxonomy to investigate the content and structure of consumers' knowledge for familiar products. The taxonomy consisted of five levels of product information as follows:

1. Best Brand
2. Whole Brand/Attribute Ranking or Comparison
3. Whole Evaluations of Brand/Attribute
4. Single Pair Comparisons/Rankings (i.e. of brand on an attribute)
5. Single Evaluation (Brand Attribute Value)

This taxonomy develops an interesting progression of increasingly complex inferential levels in the knowledge of a product category as developed in the context of a choice. However, it does not examine how these knowledge types are explicitly used in consumer choice. We will contrast our work with that of Russo and Johnson more specifically in Chapter 3.

Park and Lessig (1981) study the impact of product familiarity on consumer decision biases and on their use of heuristics. They propose two approaches for operationalizing and measuring product familiarity. These are:

(a) how much a person knows about the product (i.e. the actual amount of information contained in long term memory)

(b) subjective familiarity assessment (i.e. how much a person thinks he or she knows about the product).

In their empirical study, Park and Lessig (1981) assess subjective familiarity by asking subjects whether they have searched for information about microwave ovens, use one or own one. The respondents are assigned to one of three (high, medium and low) levels of familiarity, based on their responses. Starting with a large set of brands, subjects perform an elimination task, followed by a choice task.

Respondents with low subjective familiarity tend to use "non-functional" attributes (such as price and brand) during search, while high familiarity subjects use both non-functional and functional attributes. Those with medium level of subjective familiarity have lower levels of confidence in their evaluations. Thus, subjective familiarity can affect the nature of the information that consumers acquire during evaluation and choice. Also, the resulting confidence can differ, depending on the level of familiarity.

Alba and Hutchinson (1987) suggest that there is a need for a multidimensional view of consumer knowledge. They define two components of consumer knowledge. Familiarity is "the number of product-related experiences that have been accumulated by the consumer." The second component, expertise, is "the ability to perform product-related tasks successfully." The authors suggest propositions relating to the development of the expertise component.

Duncan and Olshavsky (1982) study the relationship between marketplace-related beliefs and prepurchase external information search. These authors also view beliefs as subjective perceptions of the individual that may or may not be true or correct. Five types of consumer beliefs are identified. These are attribute surrogates or signals, ability to judge, benefits of search, variance of offerings and variance in sources of supply. Thus, these belief categories are about the consumers' own skills and about the market, rather than being product specific.

For each of 27 beliefs, the authors hypothesize the direction of influence on information search for the purchase of a T.V. set. Differences in beliefs together account for 50% of the variance in the amount of pre-purchase information seeking. Even though the analysis is at the level of individual beliefs rather than the belief categories identified earlier, this study establishes that different types of knowledge can influence how consumers search for information.

Brucks (1985) conducts a very important study designed to clarify the meaning and measurement of product class knowledge and to examine its effect on information search behavior. Knowledge is distinguished as being objective or subjective. Objective knowledge is what an individual actually has in memory, while subjective knowledge is what individuals perceive they know.

Brucks classifies objective knowledge into the following five types: (1) terminology, (2) attributes, (3) criteria for evaluating attributes, (4) perceived correlation between attributes and (5) situational factors. This detailed typology provides a basis for understanding the role of different types of knowledge in search, evaluation and choice.

Even though Brucks tests hypotheses only about how objective and subjective knowledge affect search and does not test for the role of specific types of objective knowledge, it is useful to review the findings of the study as a starting point for additional research employing a disaggregate view of consumer knowledge of a product class.

Brucks measures subjective knowledge as consumers' self assessments of confidence in their level of familiarity. Objective knowledge types are measured by testing for content. In the experimental task, subjects acquire new knowledge about brands of sewing machines in an interactive simulation of shopping. Subjects structure their own information search task by asking the experimenter for information rather than using a brand-attribute information matrix. The intended usage situation is manipulated--subjects choose a sewing machine for a person whose needs are described as being either simple or complex.

Objective knowledge has statistically significant effects on search, but only in the complex usage situation. Objective knowledge is positively related to the number of attributes searched. This suggests that greater knowledge enables the consumer to ask questions about attributes (See also Miyake and Norman 1979). Greater objective knowledge is associated with less information search on inappropriate alternatives. Moreover, objective knowledge is also associated with greater variability in the number of questions asked about available alternatives. These results suggest that objective knowledge is related to greater search efficiency.

In discussing her findings, Brucks (1985) proposes hypotheses linking each of the five types of objective knowledge to search behavior. However, since the five types of knowledge were found to be highly correlated, the hypotheses could not be empirically tested.

Subjective knowledge shows no relationship with the number of attributes examined but is positively related to the variability of search. In the complex usage situation, subjective knowledge shows a negative relationship with the extent of inappropriate search but is positively related to the variability of search.

In summary, Brucks' findings suggest that different types of knowledge (e.g. objective vs. subjective) play different roles in search behavior. The usage situation may moderate these effects. Both conceptually and methodologically, this study provides an important departure point away from aggregate views to more disaggregate views of consumer knowledge and its effects in search, evaluation and choice.

Disaggregate Studies of Knowledge: Secondary Effects

We now turn to studies that examine consumer knowledge in a disaggregate manner and identify effects on secondary variables of interest. There are no studies that have established links between different types of knowledge and subsequent recall and recognition performance. However, a number of studies find relationships between what consumers know and the confidence that they have in their choices.

Park and Lessig (1981) find that consumers with high subjective familiarity are more confident in their choices. Thus, high familiarity may reduce the degree of uncertainty that a consumer feels. They also find that consumers with low subjective familiarity have higher confidence than those with moderate familiarity. If a person is unfamiliar with a microwave oven, he or she may lack the ability to encode new information, and may not realise what information is needed to make a thorough evaluation. This person may have high confidence, though objectively it may be misplaced. A person with a moderate degree of familiarity may realize that he or she does not know very much about the product class and hence have lower confidence.

Similarly, Brucks (1985) measures subjective knowledge as confidence. If consumers perceive themselves as having a lot of knowledge, this may reduce uncertainty and lead to higher confidence ratings. However, it is easy to see that if knowledge is actually tested, some persons who are confident may perform poorly. Thus, they may lack actual knowledge. These people may buy a product believing it is better than another, without knowing whether, in fact, there are any differences. A high priced camera may be bought because the person believes that expensive products are better, even though in objective terms, the chosen brand may not perform better than a less expensive one. A priori, the consumer may not be able to verify the validity of his beliefs about the product's quality.

In summary, the studies employing disaggregate views of knowledge examine how knowledge content is related to confidence. While no empirical work exists to date, it seems possible to develop and test conceptual linkages between different types of knowledge and its effects on other secondary variables of interest, such as recall and recognition.

Moderating Effects of Knowledge Structure

So far we have considered alternative conceptualizations of different types of product class knowledge and their role in consumer search, evaluation and choice. It is appropriate to acknowledge that the manner in which a consumer's knowledge about a product class is structured may affect the role that the particular knowledge item plays. This proposition follows from a large body of research that suggests that structural or organizational factors in memory affect knowledge activation and, thus, how it is used in choice tasks (Bettman 1979; Biehal and Chakravarti 1986).

Johnson and Russo (1984) find that as product familiarity increases, brand based organization of knowledge is more likely. Thus, if a person has a lot of experience with cameras, the overall evaluations of different brands may be further categorized into good brands vs. mediocre brands. In searching for information or making choices, this person may be able to save search effort by only retrieving brands that are in such a memory category and only considering them. The concept of an "evoked set" (Howard and Sheth 1969) is similar to this idea.

Russo and Johnson (1980) find that at higher inferential levels, knowledge is predominantly brand based while at lower levels it is mainly attribute based. Since the consumer's external choice environment is structured by brand, that may facilitate using knowledge that is structured by brand. Thus, if a consumer forms brand evaluations, these should facilitate subsequent choice tasks and this type of knowledge may be used more. There is, however, some evidence to suggest that even though memory structure may guide information processing, consumers can sometimes over-ride structural constraints when the task demands are strong enough (Biehal and Chakravarti 1982).

As another example of the effects of knowledge structure, Alba and Marmorstein (1987) have shown that the frequency of positive and negative attributes of a brand may dominate other more significant information (such as attribute importance and the degree of brand differences), when the consumer is not motivated or is unable to process attribute information.

Thus, in general, one may argue that for any given type of knowledge, differences in structure may mediate the specific way in which the knowledge functions to guide information processing. Consider the knowledge that consumers have about usage situations for cameras. A consumer may think that cameras are equally good for taking pictures in two different situations--action pictures or portraits. Differences in usage situation may not be important for this consumer, and he or she may think of cameras by brand, e.g., "The Canon Sure-shot--for all your picture taking needs." In buying a camera for use in either situation, brands may be recalled and there may be little attribute search.

A second consumer may discriminate between the usage situations. Knowledge may be structured by attribute for this consumer. Thus, if action pictures are to be taken, high shutter speed, and having a motor drive would be relevant. For portraits, a large-format camera (i.e. those using film larger than 35 mm.) would be needed. This consumer may start by considering which attributes are appropriate for the usage situation, and then search for information on those attributes. Thus, if lack of knowledge leads to ignoring differences in usage situation, a brand-based structure may be used and little attribute search may occur. If the consumer can differentiate between usage situations, appropriate attributes may be identified, and prepurchase search conducted by attribute.

In summary, depending on their prior experiences, consumers may differ in how their knowledge about a product class is structured. Such differences in structure can in turn have an impact on the way a given type is used to perform the functions of search, evaluation and choice.

Moderating Effects of Other Background Factors

In addition to knowledge structure, the role of a particular type of product class knowledge may be moderated by other task and situational factors such as costs and benefits of search, time pressure, level of involvement etc. In this concluding section of this chapter, we consider some of these effects.

In a study reviewed previously, Johnson and Russo (1984) find that recall of learned information shows a task x familiarity interaction. They explain this finding in terms of the effects of familiarity on search. During a choice task, search is postulated to be an inverted-U-shaped function of familiarity. Highly familiar subjects are more selective in acquiring new information and search less. Low familiarity subjects have little basis to conduct a search and also show less search. Only the moderately familiar subjects have both the need and the ability to search. In contrast, during a judgment task, the greater the familiarity the more easily new information is encoded. Thus search is expected to increase monotonically with familiarity. The recall data support this reasoning. Thus, task factors seem to moderate how knowledge is used.

Punj and Staelin (1983) assume that cost and benefit assessments underlie automobile search behavior. They argue that if there is a high level of knowledge of specific makes and dealers, there is relatively little to be gained by search, i.e., the expected benefits of search may be low. If knowledge of the product class in general is extensive, search may have greater benefits because new information can be more effectively comprehended.

Most studies of search behavior seem to use type of product as a background factor. Typically, search and evaluation are examined for relatively complex, high-value products like automobiles, stereos, microwave ovens etc. For low-cost non-durable products, there may be less information search. Also, patterns of search for such products may be more similar across people than for durable products (See for example Newman and Staelin 1973, Brucks 1985).

Time pressure is another background factor that can mediate the function of knowledge. Consider a consumer who wants to buy a stereo as a gift. If a large number of brands are available, some sort of screening may be necessary. The tendency to save search effort may be accentuated under time pressure. For example, a consumer may be able to save search effort by examining only one of a pair of correlated attributes.

The level of consumer involvement may be another moderating factor. A consumer who is not highly involved in a purchase may want to reduce search and evaluation effort and may not search extensively. This consumer may rely on some general prior knowledge, e.g. using price as a cue to the quality of the product. This could lead to the choice of a more expensive product relative to when he or she is involved enough to search extensively. Thus, in this case, a background factor such as involvement may moderate how knowledge is used in a consumer task.

To summarize, this chapter examines the literature on consumer knowledge. We review studies that take both an aggregate and a disaggregate perspective on consumer knowledge. The latter view, which distinguishes between types of knowledge, permits the study of the role of specific types of knowledge in search, evaluation and choice. Secondary effects on recall, recognition and confidence can also be examined. It is argued that this perspective provides a richer and potentially more useful approach to the study of consumer product class knowledge.

This chapter also acknowledges the role of other factors that may moderate the role of knowledge. These include knowledge structure. The role of background factors like task structure, time pressure, search costs and benefits and involvement are pointed out.

In Chapter 3, these elements are combined and developed more formally as a conceptual framework for studying the role of consumer knowledge. The bulk of that chapter will be devoted to a discussion of proposed typology of consumer product class knowledge. Each type of knowledge in the typology will be linked to its functions, using examples from the consumer environment. Conceptually relevant factors that may moderate these relationships will also be considered.

CHAPTER 3
CONCEPTUAL FRAMEWORK

The preceding chapters examine research in which consumer knowledge is studied at both aggregate and disaggregate levels. The review establishes both the lack of a rich disaggregate taxonomy of consumer knowledge and also a sparse set of empirical studies. Thus, there is a need for a taxonomy that examines different types of consumer knowledge and their functions and establishes these linkages empirically. Moreover, an explicit consideration of the background task factors as well as the likely effects of knowledge structure would enrich both the conceptual and empirical contributions of the research. With the above in mind, the conceptual framework in Figure 3-1 is designed to study how different types of consumer knowledge can serve functions in search, evaluation and choice. This chapter next presents a disaggregate typology of consumer knowledge that is linked within the conceptual framework to various functions in different consumer information processing scenarios. Where appropriate, the moderating role of background factors and structure is considered to provide a more complete appreciation of the benefits of adopting such an approach to the study of consumer knowledge effects.

Overview of a Typology of Product Class Knowledge

As discussed in Chapter 2, Brucks (1985) proposes one of the first disaggregate categorizations of objective consumer knowledge. We build

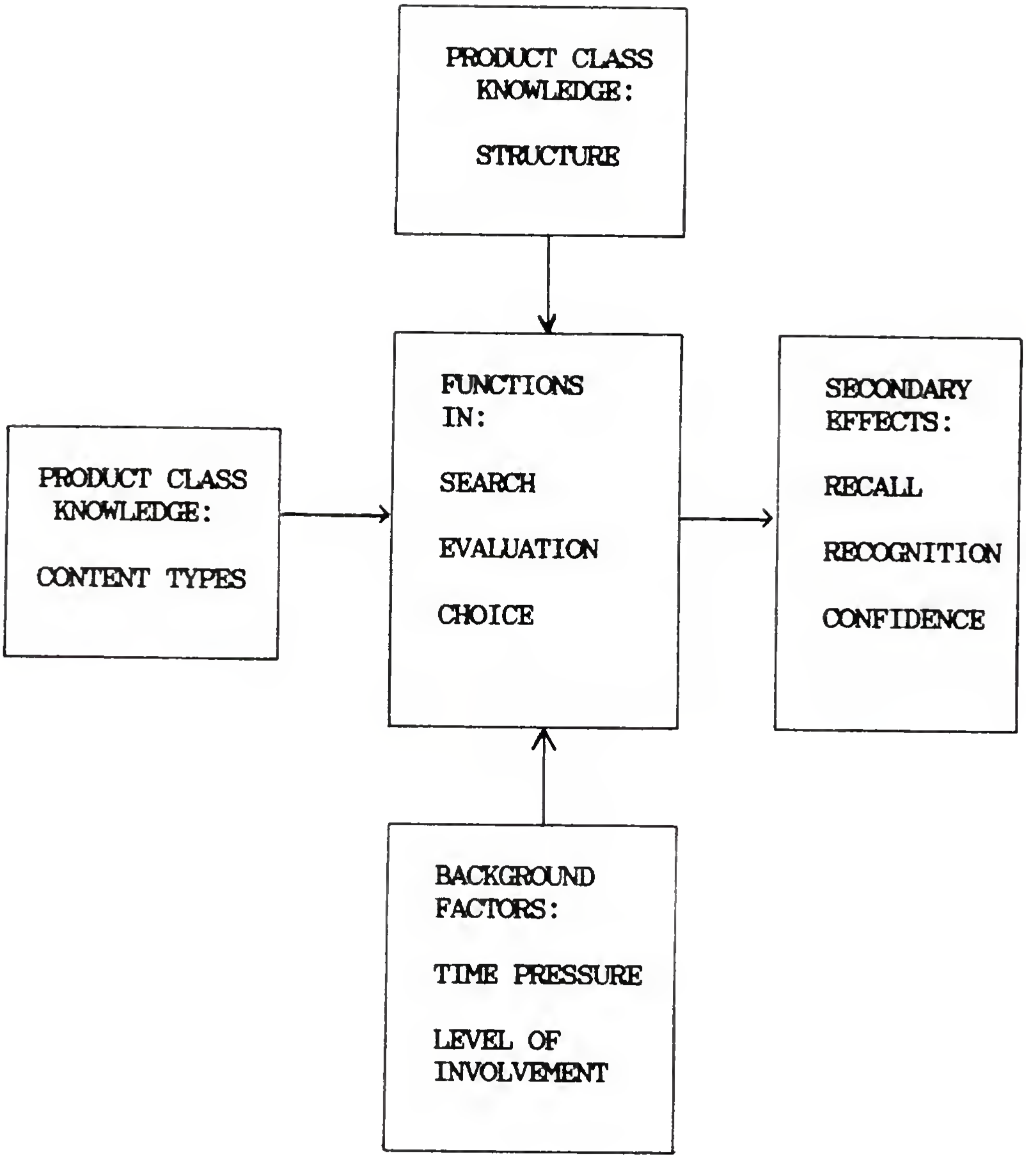


Figure 3-1
Conceptual Framework for
Product Class Knowledge Effects

on her work and propose that an extended categorization of consumer knowledge of a product class may be stated as follows:

1. Terminology specific to the product class.
2. Attribute values of brands in the product class.
3. Range of available attribute values.
4. Correlations between attributes.
5. Summary evaluations or affect towards brands in the product class
6. Importance of attributes.
7. Usage situations appropriate to the product class.

Of these types of knowledge, four--terminology, attribute covariation, criteria for evaluating attributes (similar to attribute importance) and usage situations--are also proposed by Brucks (1985). Moreover, these can also be related to some elements of the hierarchical taxonomy suggested by Russo and Johnson (1980). Similarities and differences with respect to the other typologies will be considered where relevant, as we continue our discussion of the typology.

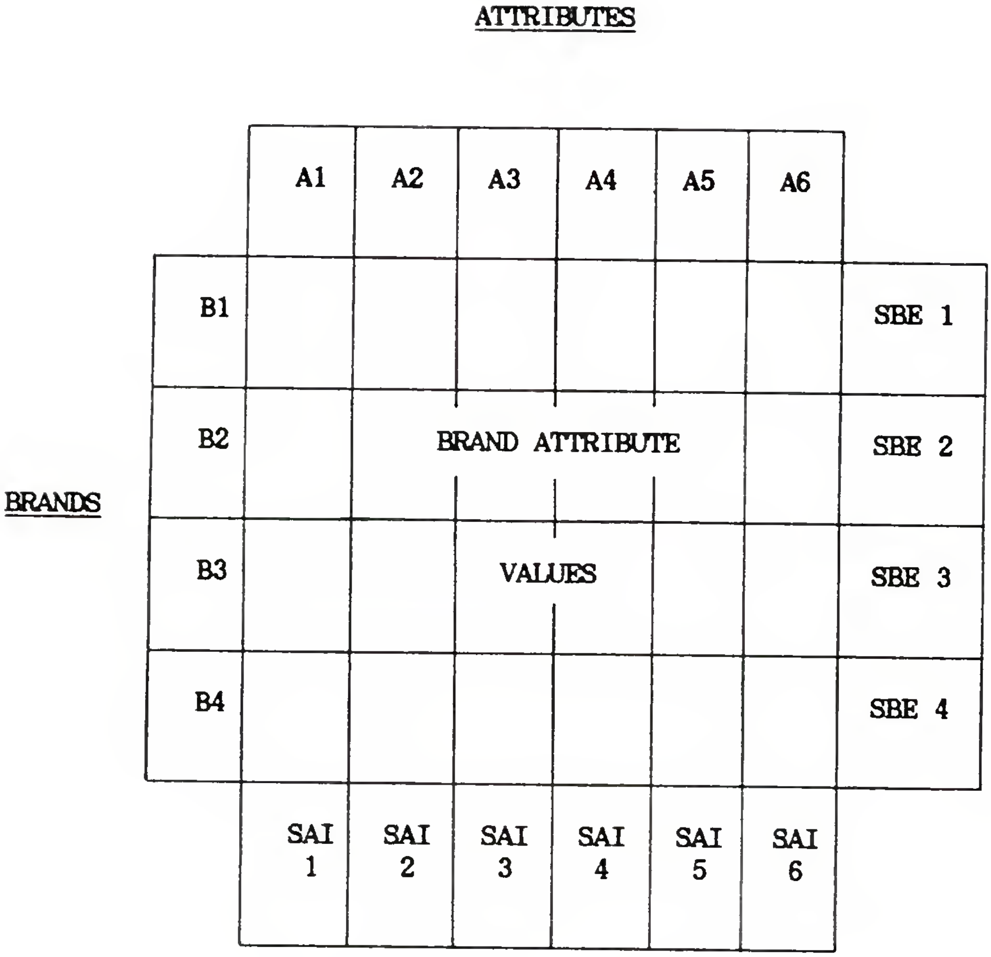
The seven types of product class knowledge cover information that is typically found and used in the consumer environment. On occasion, each type is directly and externally available to the consumer, e.g., terminology or brand attribute values in media-advertising messages, seen in a store or in articles such as in Consumer Reports. In other cases, the consumer may derive the knowledge by processing information about the product category. Thus, the range of attribute values or inter-attribute correlations in a product class can be learned by examining a number of brand alternatives. Summary brand evaluation or summary attribute importances may be learned directly from advertising, by word of mouth or derived based on observation, experience and product usage.

In order to further develop the meaning of each of these types or categories of product knowledge, we will refer to the brand-attribute matrix presented in Figure 3-2. While each of the items in the taxonomy obviously has broader implications than what might be developed within this example, it is nevertheless useful for illustrating the framework being developed.

Terminology relevant to a product category includes knowledge of product attributes and also the specific language used to describe the product category or the usage of the product category. Thus, in the context of our brand-attribute matrix, "lens sharpness, "shutter speed" and "aperture size" constitute examples of product-class terminology. In many instances, knowledge of such terminology may be viewed as the ability to relate these attributes to specific features or benefits associated with the product, e.g., the relationship between "shutter speed" and action photography.

The cell entries in the brand-attribute matrix (Figure 3-2) are the analog of knowledge of attribute values in a product category. These raw "information items" may also be viewed as the "brand beliefs" component of a multi-attribute attitude model (Wilkie and Pessemier 1973).

Knowledge of the range of available attribute values is one type of distributional information that a consumer may possess about a product class. In the context of Figure 3-2, it is viewed as the difference between the highest and lowest brand values on an attribute. Range knowledge may of course be significantly richer than just knowledge of



Terminology - e.g. Attributes
Range - going down columns
Correlation - between columns
Summary Attribute Importance - SAI
Summary Brand Evaluation - SBE
Brand Attribute Values - cell entries
(Usage Situation is not shown)

Figure 3-2
Types of Knowledge

the end-points of the range. Consumers may know about the density of available brand values over different parts of the range.

Knowledge of the correlation or association between the brand values on two attributes is another type of product class knowledge. Such knowledge may be generic (e.g., a price-quality association) or specific to the product class (e.g., in our brand-attribute matrix, cameras with better lens quality scores also have higher maximum shutter speed values). Knowledge of such associations between brand values on attribute pairs may be environmentally observed or learned directly by word of mouth.

Summary brand evaluation may be thought of as knowledge of the marginal values of brands in the consumer's awareness set. In the context of the brand-attribute matrix in Figure 3-2, a consumer could integrate the available information for each brand and come up with an evaluation of the brand. Alternatively, the evaluation may have been picked up by word-of-mouth or from reading Consumer Reports and the consumer may not have an underlying integrated structural knowledge of brand-attribute values.

Attribute importances may be viewed as the marginal values that a consumer may place on attributes when evaluating brands in a product category. These may take the form of value weights applied to beliefs or expectancies about brands (as in a multi-attribute modelling framework) and may have a rich underlying structural knowledge of the relationship between the possession of an attribute value and its relationship to product benefits. In fact, while the conceptual distinction between weights and scale values is fairly clear, it has often been difficult to empirically distinguish between them (Anderson 1981, 1982).

Recent research has also documented the importance of situational factors in consumer behavior (Belk 1974; Kakkar and Lutz 1981; Dickson 1982). This category of knowledge pertains to judgments of the appropriateness of brands for specific purposes relevant to the product category. Alternatively, knowledge of usage situations may link to knowledge of attribute importances or situation specific summary brand evaluations (Srivastava, Alpert and Shocker 1984).

The points made above illustrate an important consideration in taking a disaggregate view of knowledge. Clearly, at some level, these different types of knowledge may be linked in a cognitive structure and are derived from each other. Nevertheless, an attempt to disentangle them functionally would lead to a better understanding of how they might guide consumer information processing functions in choice. Figure 3-1 is an overall conceptual representation of this very critical point. The following section develops this model for each identified element of our knowledge taxonomy and illustrates each with an example.

Components of the Product Class Knowledge Typology

Terminology

As Brucks (1985) states, having knowledge of the relevant terminology "makes it easier to ask questions and interpret their answers." Terminology is the "language" relevant to the product class and is basic to the comprehension of meaning. If knowledge is lacking, a consumer may be unable to search effectively and may have difficulty evaluating brands. On the other hand, a consumer who knows the relevant terminology can understand the meaning of communication messages, and product class information available in the environment.

A consumer who is unfamiliar with the terminology relevant to cameras may either limit search or turn to other sources such as friends or salespersons for the meaning of terms like lens sharpness or aperture size. In contrast, a consumer who knows the meaning of these terms can make sense of information about camera models presented in an advertisement or in a store and may in fact search more and independently. Moreover, this latter consumer may use knowledge of more advanced terms, such as motor drive and manual over-ride capability and search for information about these more advanced features.

Brucks' (1985) typology has separate categories for knowledge of terminology and available attributes. In contrast, as envisaged here, terminology can include the meaning of attributes, and also terms relating to the way the product is used. For example, the user of an SLR camera should know the meaning of "load" and "rewind" the film. Knowledge of attributes and the way a camera is used will both be used by a person to formulate questions, and interpret new information.

Brand-Attribute Values (BAVs)

Consumers may possess basic or "raw" knowledge of the value of a brand in a product category on any particular attribute. Examples are "The Pentax K-1000 has a price of $150" or "The Minolta Maxxum costs $450." While such knowledge may or may not be veridical, it forms the basis for other information processing that builds more complex forms of knowledge. It is obvious that this kind of knowledge is the basis for further evaluation of the brand. These values can be related to each other or compared to other criteria in order to form brand evaluations. For example, the price of the Pentax camera may be compared to a criterion on that attribute (e.g. SLR cameras usually cost over $120), or to the brand-attribute value for another alternative (the Minolta, in this case).

Brand Attribute Value is the lowest category in a hierarchical typology of consumer knowledge proposed by Russo and Johnson (1980). As they point out, the processing of brand-attribute values in comparison with each other using elements of processing heuristics (Bettman and Park 1980) generates more complex forms of knowledge. Alternatively, complex information may be obtained from the environment e.g. from advertising or by asking others for recommendations, recognizing that such knowledge is generated by some prior information processing conducted by the source.

Brand-attribute values may also be used in conjunction with other forms of knowledge to generate information pertinent to the consumer's task. Thus, a consumer who knows the price of a brand in a product class can make inferences about its quality on the basis of the knowledge of a price-quality correlation.

Attribute Range Knowledge

A consumer may know that the power output for better stereos intended for home use is between 20 and 100 watts. This knowledge of the range of brand-attribute values available can be used as a context for provisionally evaluating new information on brand-attribute values. Provisional evaluations made using range knowledge may in turn guide further search for information. Use of range knowledge in this manner may be more likely if the consumer is unfamiliar with the product class and has difficulty understanding the meaning of a given item of information.

Consider a consumer who is unfamiliar with the terminology relevant to the characteristics of stereos. He may not know the meaning of output power, or how output power is related to the way a stereo sounds. On seeing an advertisement that says "The Technics SX 615 has an output of 80 watts," this consumer may find it difficult to comprehend the meaning of the information given in the ad and may search other brands on output power to establish the context for an evaluation.

In contrast, a consumer who knows that the available range of power output values is 20 to 100 watts can use that information to generate a provisional evaluation. Thus, the stereo with 80 watts output may be seen as being quite good on that attribute and this evaluation may guide further search. The alternative may be searched further on other attributes e.g. price, warranty terms and distortion in order to conclusively establish its overall acceptability.

A mechanism by which range knowledge impacts on consumers' evaluation, search and confidence is proposed in Assar and Chakravarti (1984). This and associated issues that warrant further research are discussed in Chapter 4. A subsequent section of this dissertation will develop the concepts further and conduct a detailed empirical investigation of attribute range knowledge effects.

Attribute Correlation

Consumers may learn about the existence of associations between attributes of products from advertising stimuli, by experience or from other people. Some correlations may be general and perceived to exist across product classes (e.g. "Higher priced products are of better quality"). Other correlations may be specific to a product class (e.g. "Higher priced cameras have better quality").

When the correlation between two attributes is known, consumers can use this to make predictions or inferences about information that is missing or is yet to be collected. Thus, Brucks (1985) suggests that knowledge of attribute covariation enables inferences to be made about attributes without external search. If information on one attribute is missing in the environment, or is forgotten, brand values on the other attribute may be used along with the correlation to infer the missing value without searching for the information. Knowledge of the correlation, thus, may be used to reduce the effort associated with search and information acquisition in the context of a choice. In particular, excessive search costs or the presence of time pressure may accentuate the consumer's tendency to use correlational knowledge in the manner suggested above.

Similarly, a consumer who lacks a high level of involvement in the task at hand may seek to conserve search effort by only examining one of a pair of correlated attributes. Clearly, the use of such a search strategy will have consequent impact on search.

This dissertation will also present an empirical study designed to explore the circumstances under which correlational knowledge is used by consumers and the specific way in which such knowledge impacts upon search, evaluation and choice.

Summary Brand Evaluation

The stored overall evaluations of brands in a product category are clearly important components of product class knowledge. An example of such knowledge is a statement such as "Nikon cameras are very good." Consumers may obtain such evaluations from external sources such as advertising or the recommendations of others and can hold such evaluations without an underlying knowledge base of brand-attribute values. By contrast, more experienced consumers may form their own summary evaluations or modify externally derived ones, based on specific experiences.

Summary brand evaluations for one brand may have effects on (1) the extent of search of specific alternatives and (2) how other alternatives are evaluated. Moreover, the nature of these effects may be mediated by the underlying categorical structure in which such summary brand evaluations are stored.

Summary brand evaluations may impact on the extent of search in a number of ways. First, a brand which has a very favorable summary evaluation (e.g. Nikon), may be chosen based on the stored evaluation, without extensive search for information. This may be more likely given external conditions like time pressure. However, an accessible stored overall evaluation may make it less likely that individual brand-attribute values are accessed from memory (Lingle and Ostrom 1981; Lynch and Marmorstein 1987; Biehal and Chakravarti 1986).

Second, overall evaluation of a brand may form a basis for inferences about brand-attribute values that are missing in the context of a choice task (Dick 1985). Thus, if the aperture size for a particular model is not featured in an ad, it may be inferred to be large, consistent with the favorable evaluation. Alternatively, when a consumer is in a store and attempting to retrieve specific features of brands previously encountered in another store, an inference based on a prior evaluation may form the basis for the judgement.

Third, the affect associated with a brand may be transferred to other alternatives so that judgments and choices are made without search. For example, a camera such as Nikon, that is categorised as a good brand may produce favorable overall evaluations of all Nikon models while new models of other brands may be inferred as mediocre, if such a brand categorization exists.

Finally, a poorly evaluated brand may be ignored completely or dropped from the candidate set and not be examined at all during search. Moreover, an explicit inference, if made, for a mediocre brand is likely to be mediocre under evaluative consistency processes (see Lingle and Ostrom 1981).

Summary brand evaluations may also impact on information processing strategies in evaluation. First, if a favorable summary evaluation exists for a brand, its attribute values may be used as criterion levels during search of attribute values of other alternatives in a set. For example, if Nikon is known to be a good camera, its characteristics may be used as the ones to beat when new brands are examined. Second, if the summary evaluation is highly favorable, the consumer may not do pairwise feature comparisons, as is implicit above. Rather, other alternatives may be evaluated in wholistic fashion and these overall evaluations compared to that of the memory brand.

Thus, the preceding discussion suggests how knowledge of overall brand evaluations may guide consumer information processing in search, evaluation or choice. While these knowledge functions are very important and deserve critical enquiry, empirical work in these areas is outside the scope of this dissertation.

Summary Attribute Importance

Knowledge of the value or the "importance" to attach to relevant attributes is clearly critical for judging brands in a product class. Thus, the statement "The most important thing in a camera is the quality of its lens," clearly prioritizes the critical factor in the choice of a camera.

In most models of multi-attribute judgments, it is assumed that the evaluation of an attribute level can be distinguished from the weight given to that attribute and that when a set of alternatives is evaluated, importance is held constant across the entire set (See for example, Anderson 1981, 1982). These "importance weights" that are learned from various sources, may be abstract judgments of value or may be derived from an understanding of the relationship between the feature of a product and the benefit associated with the possession of that feature.

This type of knowledge is similar to a form of product class knowledge proposed in Brucks (1985) i.e. criteria for evaluating attributes. Attribute importances may be compared and used to select attributes for search from a larger set. Attribute importances may also be used in some combinatorial rule for evaluation. However, Brucks proposes that such criteria may be used as reference points, to decide whether an alternative is acceptable. In this sense of judging alternatives, the criteria are cutoffs on attribute values, or on overall evaluations, rather than attribute importances in the true sense of the term.

Some consumers lack a basis for differentiating between attributes. Their search process is more contingency driven or "constructive" (Bettman 1979; Bettman and Zins 1979; Biehal and Chakravarti 1986). If summary attribute importances are learned by experience, this knowledge may be used tentatively in the initial stages. As consumers improve their understanding of the relationship between attributes and product performance, there may be more variance in the extent of search across attributes. Thus, knowledge of attribute importance is a basis for selectivity during information search.

Specific patterns of attribute importance weights may manifest themselves in the heuristics used in evaluation. Thus, sharply different importance weight structures may produce greater use of non-compensatory strategies in search (Biehal and Chakravarti 1982). Such effects are more likely in the presence of background factors such as a large number of alternatives, time costs, etc. These background factors and their effects on search heuristics have been extensively examined in the literature (Bettman 1979).

Usage Situation

The situation in which a product is intended to be used is sometimes an important consideration, affecting the pattern of search and also evaluations. Knowledge of the usage situations appropriate for a brand may prompt a matching of the product/brand to situational requirements on features or performance (Brucks 1985). Situational variations may make different attributes more or less important and also affect the appropriate criterion levels for those attributes. Thus, in the marketing literature, situational factors and their interactions with product and person factors are an important basis for market segmentation (Dickson 1982; Srivastava, Alpert and Shocker 1984).

Consider two different usage situations for a camera--taking action pictures, and taking portraits. Knowledge of the situational appropriateness of brands may lead to the choice of a Nikon for action pictures whereas a Yashica may be preferred for portraits. In other cases, the action picture situation may prompt consideration of shutter speeds whereas the size of the film may be a more important consideration for portraits. The structure of knowledge affects both how information is searched as well as what information is searched.

A final illustration of the importance of usage situations has to do with social aspects of consumption, particularly for products such as food, beverages and clothing. In social contexts, social influences or the expectations of others are likely to be important. These aspects represent background factors that might moderate a consumer's judgment of the appropriateness of the brand for the particular social situation. Thus the social aspect of a situation is one of several background factors that moderates the search, evaluation and choice of brands in a product category. In some ways, this may be a reconceptualization of the normative components of a consumer's belief system for a product category.

Distinctions from Other Knowledge Typologies

Our proposed typology builds on Brucks' (1985) work but does have several distinctions from the typology proposed by Russo and Johnson (1980). We will now explore some of these differences. Russo and Johnson's typology is designed to explore consumer knowledge of familiar products. Their protocol analysis reveals knowledge at several "inferential levels": (1) Best Brand; (2) Whole Brand/Attribute Ranking or Comparison; (3) Whole Evaluations of Brand/Attribute; (4) Single Pair Comparisons/Rankings (i.e. of brand on an attribute) and (5) Single Evaluation (Brand Attribute Value).

First, since Russo and Johnson focus on "inferential levels," they do not clearly delineate between the different categories of knowledge by function. Level 2, for example, includes rankings or comparisons of both brands and attributes. One might argue that the summary brand evaluations and attribute importance categories develop the brand versus attribute knowledge distinction while collapsing what seems like an arbitrary distinction between Russo and Johnson's inferential "levels" 2 and 3.

Summary brand evaluations in the proposed typology could include (1) "Brand X is best" or (2) "Brand X is very good." These are both evaluative, but differ in degree. In the Russo and Johnson typology, a distinction would be made based on degree of goodness--the first example is in the level 1 (Best Brand) whereas the second is at the level 3 (Whole Evaluation of Brand).

Second, the knowledge category termed "Brand-Attribute Values" in our typology are statements about the level a brand possesses on an attribute (e.g. "The Pentax K-1000 costs $150"). Russo and Johnson's lowest inferential level (Single evaluation--also termed Brand Attribute Value) may be a basic statement of fact or perception. Alternatively, it may have an evaluative component (e.g. "The Pentax K-1000 is inexpensive"). Thus, as the above distinctions indicate , the focus of our typology is to discriminate between knowledge types based on the functions that they play in choice. In contrast, Russo and Johnson (1980) discriminate between knowledge types on the basis of inferential levels in an information processing hierarchy. Further, given the difference in the objectives of the two typologies, it is understandable that attribute range, inter-attribute correlation, usage situation and terminology knowledge show no clear mapping to Russo and Johnson's typology.

Functions of Knowledge in Consumer Information Processing

Our references to the functions of knowledge denote the way in which it is used by a consumer. The various knowledge elements in our proposed typology serve different functions in search, evaluation and choice. This categorization permits a clearer enunciation of the role of each type of knowledge. A given type of knowledge can serve different functions. For example, the knowledge of an inter-attribute correlation may be used to save effort in search. Inferences about missing information can be made from it in evaluating brands. The particular role that a given type of knowledge plays depends on a variety of background factors, including structure. At the same time, it is also clear that different types of knowledge can also be used to perform the same information processing function. Thus, both range knowledge and a prior summary brand evaluation can be used to form a provisional evaluation of a new piece of information for a brand.

In concluding this section, we develop an inventory of general propositions regarding how different types of knowledge may be used in different functions.

First, in search, knowledge may be used to make sense of information, and enable a consumer to understand the meaning of attributes and terms related to usage. In these cases, knowledge increases search. In other cases, knowledge reduces search effort by eliminating the need for a complete and exhaustive acquisition of information. These effects on search patterns may be accentuated or attenuated by background factors such as time pressure, or a low level of involvement. Thus, different types of knowledge can sometimes have opposing effects on search.

Second, in evaluation, knowledge provides criteria and contexts for evaluation. Thus, if terminology comprehension is low, range knowledge provides a context for evaluating a given brand-attribute value. Summary brand evaluations can be used as a criterion to compare other brands in overall terms.

Finally, in choice, knowledge permits the identification of dominance in objective or affective terms. Thus, a very favorable summary brand evaluation may form the basis for choosing a brand. The chosen brand may either be objectively superior, the degree of affect may be very positive, or both conditions may exist. Clearly, such a choice, made on the basis of an overall evaluation also significantly reduces choice processing effort.

As stated earlier, the empirical portion of this dissertation examines the use of range and correlational knowledge in search, evaluation and choice. The next chapter reviews the literature pertaining to range knowledge and its effects and provides examples from the consumer environment. This literature review motivates the empirical study to be reported in Chapter 5.

CHAPTER 4

KNOWLEDGE OF ATTRIBUTE RANGE IN A PRODUCT CATEGORY: EFFECTS ON EVALUATION AND SEARCH

As indicated in previous sections, this chapter elaborates upon the manner in which a consumer's knowledge of the range of attribute values available in a product category affects information processing, evaluations and choices. We will first review the existing literature in related fields and then develop a proposed mechanism by which range knowledge may affect consumer search, evaluation and choice. We will also set forth the formal propositions regarding these effects that were tested in the empirical study described in Chapter 5.

To motivate the propositions that follow, consider the case of a prospective car-buyer who is confronted with information regarding the gas-mileage rating of a compact car. Moreover, suppose that this (rather naive) consumer is not abreast of recent fuel-economy information and knows little about the available range of gas mileage values. This consumer may be unable to evaluate information saying that the gas mileage rating of the car is 40 m.p.g. However, if he or she knows that compact car gas mileage ratings range from 32-40 m.p.g, the 40 m.p.g. value becomes meaningful and the car's gas mileage rating can be coded as the "best available" in the product category. This preliminary evaluation would qualify the model as a viable choice candidate, and it would be searched further on other attributes.

Consider yet another situation where in a cigarette ad comparing brands on their tar content, brands are presented ordered by their level of tar. If brand A is lowest on tar, a smoker may evaluate the cigarette favorably, without taking account of the actual health effects of that level of tar content. Moreover, if brand B is higher on tar, it will be seen as worse on that attribute and the consumer may form a negative overall evaluation of it, again without regard to the actual health effects. In this situation, presenting rank order information within a range of values may provide a basis for polarization of evaluations, without recognition of the equally deleterious health effects of the two brands.

As these examples show, range information may be naturally available to consumers in memory or in their environment. This information may strongly influence how consumers form evaluations of new information and how they then search for further information in the context of making a choice in a product category.

Social Judgment Research on Range Effects

Research in social judgment has found that judgments of a stimulus are affected by values of other stimuli present in the judgment context. These other stimuli can be used as a basis for comparison (Sherif, Sherif and Nebergall 1956). Suppose a camera is priced at $150. A judgment about the price of brand A may differ, depending on whether the judgment is made in the context of other brands priced at $100 or $200.

Knowledge of the range of an attribute provides one type of information about the judgment context. Several classic studies have shown that the ratings given to a target stimulus were related inversely to the values of stimuli judged concurrently. These phenomena have been termed "contrast effects" (Sherif and Hovland 1961; Ostrom and Upshaw 1968). Thus, two stimuli are likely to be rated as more similar on a given dimension when the range on the dimension is wide, relative to when the range of values on that dimension is known to be narrower.

Extending our previous example, consider two camera brands A and B, priced at $150 and $200, respectively. If the prices for available cameras range between $100 and $500, then A and B are likely to be judged as more similar, compared to the case when prices range between $150 and $250. When the wider range is used as a context, the stimulus judgments shift away from the upper end of the range which serves as an anchor. This, in effect, is the well-known contrast effect.

If A and B are seen as similar, the consumer may perceive them as comparable alternatives that are in the same "ballpark" on price. But in the narrow range context, A and B may be seen as less similar and the consumer may perceive them as falling in different price categories. Thus the knowledge of attribute ranges may lead to differences in perception. These perceptual differences in turn may affect evaluations and subsequent choices.

Range effects have been interpreted in two ways. One explanation is that those effects truly reflect changes in how a person actually thinks about stimuli, i.e., they are effects on mental representations. Others have argued that these effects are due to changes in how subjects use response scales to report judgments that are not affected by range context, i.e., they are merely effects on the "response language" (Wyer 1974).

It is important to distinguish between these explanations for any specific study of range effects. Chakravarti and Lynch (1983) have reviewed this controversy and the empirical evidence. Their review shows that the weight of the empirical evidence is that range effects occur on response language, and that the effects are not carried over to other judgments or to subsequent behavior. While representational effects are intuitively plausible and discussed in the literature (Sherif and Hovland 1961; Helson 1964), they have been difficult to demonstrate empirically.

Range effects of a representational nature may be more likely when subjects are unable to comprehend the dimension of judgment (Hutchinson 1983). This may be viewed as a knowledge effect that represents an interaction between terminology knowledge and range knowledge, two of the elements in our taxonomy. Alternatively, such effects may occur in judgments that require trading off incommensurable dimensions (Mellers and Birnbaum 1982). These conditions which favor representational effects will be considered in more detail when we discuss a mechanism by which range information may influence search.

When a prior response language driven rating is made salient on a subsequent occasion, that rating may serve as a basis for behavior. In studying contrast effects, Sherman, Ahlm, Berman and Lynn (1978) found subjects rated the importance of a recycling program higher in the context of a trivial issue, and lower in the context of an important issue. Later, when these ratings were made salient, subjects were more willing to help with a recycling program if they had earlier rated that issue as important relative to the trivial context.

Economics Research on Range Effects

In the economics literature, the dispersion of alternative values on an attribute has been seen as a determinant of search behavior. The models typically consider dispersion of prices. Stigler (1961) saw price dispersion as a measure of ignorance in the market. If consumers are not well informed, sellers' prices are likely to be widely dispersed. If the dispersion is large, it will pay to search several sellers in order to get the lowest price, as long as the expected saving is higher than the cost of search. The amount of search conducted to get a lower price is positively related to the variability of prices.

Rothschild (1974) proposed that with increasing price dispersion, the intensity of search increases. As prices become more dispersed, the expected total costs (including price and search costs) will decrease. Kohn and Shavell (1974) developed an analytical model of the behavior of an individual searching sequentially. The attribute searched (e.g., price) had a distribution which was either known with certainty (the static case) or not known with certainty (the adaptive case). Search continued until the individual found an alternative for which the utility was greater than the "switchpoint, defined as "the level of utility at which the expected immediate cost of continued search equalled the expected future gain of search." The location of the switchpoint was related to the characteristics of the distribution, in addition to search costs and the individual's risk aversion.

When the distribution was known with certainty, the switchpoint was lower, i.e., the consumer searched less than in the adaptive case. In the latter (adaptive) situation, searching enabled the individual to learn about the distribution. By the same token, if the variability (risk) associated with the static distribution was increased (preserving the mean utility), the switchpoint increased, leading to more search and compensating for increased risk.

Stigler (1961) proposed two different search strategies--one where the consumer decides on the number of draws before starting (fixed sample size) and the other being sequential search. Gastwirth (1976) analytically explored how the optimal number of searches varies with the assumed price distribution and search costs. With a fixed sample size, the optimal number of searches increases with search costs. Only when search cost is very small does the optimal number of searches vary greatly with the price distribution. However, for sequential search, the optimal number of searches is much more sensitive to the form of the assumed price distribution.

Axell (1974) proposed an adaptive model for how consumers and firms search in the market for durable products (cars). According to this model, if the mean or variance of the price distribution is not known to the consumer, some initial estimate of the variance of price is used. This estimate is updated as prices are sampled during search.

Wilde's (1980a) model focuses on search of alternatives. In this model, the consumer is assumed to rely on a subjective estimate of the joint distribution of prices and quality levels that are available in the market. During search, the consumer is assumed to observe a price p only, and information about quality (q) is provided by the conditional distribution of quality, given p.

Clearly, even this selective review of the economics literature establishes that extent of search is postulated to be greater when there is more variability on an attribute, e.g., the range is wider. However, little empirical work has focused on how variability on an attribute affects the behavior of consumers in search, evaluation or choice. Studies in the economics of information have been cited in marketing as evidence that consumers' search behavior depends on the variability of an attribute. Though range on an attribute is not explicitly treated in this literature, the ranges of price (or other attributes) can be considered as one aspect of the variability of the distribution of an attribute.

Marketing Research on Range Effects

The effect of attribute variability on consumers' search behavior has been empirically examined in two studies. Meyer (1982) modeled how consumers update their expectations/perceptions about a set of alternatives during sequential search. He proposed that the probability of inspecting an alternative is a function of the consumer's expected value or mean for each attribute, and the variability of each attribute as perceived by the consumer.

Subjects in the Meyer (1982) study searched for information about apartments. They were given one item of information (i.e., the value on one attribute). The range of values on another attribute was manipulated, thus operationalizing variability. The study found that an alternative's inspection probability increased monotonically with its riskless value and the uncertainty (i.e., range of values) associated with it. Thus, the probability of searching alternatives is higher for wider ranges of the given attributes.

Goldman and Johansson (1978) used the economics of information framework to develop and test hypotheses about consumers' search behavior for gasoline. They hypothesized that the propensity to search was positively related to perceived variability in prices, and negatively to the opportunity costs of time and to the importance of the choice of filling station. The data in this study were taken from a panel on gasoline purchases. The extent of price variability was based on consumers' perceptions of the similarities and differences among brands, based on price levels and price fluctuations.

The authors found that perception of variability in prices had no significant effect on propensity to search. As an explanation, the authors proposed that if monetary savings of search are small, economic factors may have little explanatory power, compared to non-economic ones. However, the extent of price variability in this study was not stated. If the level of variability is low, consumers would not expect to save much and they will search less. Further, consumers may wish to buy a well known brand or expect competent service. These non-economic factors may make the choice of gas station to be more important than the desire to save, and search may be reduced once the consumer finds a gas station with a reputation to maintain. Consistent with this explanation, the authors found that a variable measuring importance of gas station accounted for about a third of the explained variation in propensity to save.

While the empirical evidence is mixed, the conceptual work clearly postulates that the amount of search is positively related to variability on an attribute. Coupled with our intuition regarding how consumers may use range knowledge, this evidence suggests that range knowledge may play an important contextual role, affecting consumers' search, evaluations and choices among brands in a product category.

Range Knowledge in Sequential Search

So far the effects of range knowledge on search and evaluation have been treated separately. However, range knowledge may produce dynamic interplays between evaluation and search. In many consumer choice situations, all judgment-relevant information is not available simultaneously. Rather, information may be gathered or become available sequentially, and the consumer may have to decide which pieces of information should be gathered.

In the economics literature, there is considerable support for the idea of consumers searching sequentially. Early models assumed a known underlying distribution and discussed searches of fixed sample size. However, more recent models acknowledge that the distribution of prices is typically not known, and that searchers can obtain information sequentially (Stigler 1961). Consequently, in these situations, the optimal search pattern is adaptive in nature. Consumers obtain information sequentially, learn the distribution of alternatives and decide how much search is appropriate. See, for example, Kohn and Shavell (1974), Gastwirth (1976) and Axell(1974).

This literature discusses sequential search only as a means of estimating the price distribution of alternatives. However, it embeds the more general idea that when information is sparse, sequential search enables a consumer to learn about the available options.

The nature of further search may be mediated by the consumer's ability to interpret the initially available information. For example, if the meaning of an attribute is not clear, range knowledge may be used as a context to evaluate a given brand-attribute value. If the brand-attribute value suggests the brand is best on an attribute, it may be examined on other attributes. If the given brand is evaluated as mediocre or poor, other brands may be searched.

Attribute Range Knowledge: Effects on Evaluation and Search

We now move to a formal discussion of the mechanism by which we propose range knowledge may impact upon evaluation and search.

Assar and Chakravarti (1984) examined the role of range information in evaluation and search. They provided a mechanism for range effects and conducted a preliminary study that provides the basis of the empirical work to be presented in this dissertation.

Consider a consumer examining single lens reflex (SLR) cameras. If confronted with an attribute such as lens quality, the consumer may find it difficult to make sense of a brand-attribute value if the attribute is unfamiliar. On the other hand, even this unfamiliar consumer may be able to evaluate a given camera's lens quality score if a range is provided on an index of lens quality. Thus, range information can aid provisional evaluations by providing a context for the evaluation.

Turning to search, when information is examined sequentially, range information may enable selective processing of available information.

Range information permits a preliminary evaluation of a brand-attribute value encountered during choice. This preliminary evaluation may mediate subsequent search. Thus, if the preliminary evaluation is favorable, the brand may be examined further. Lynch (1981) proposed that ad hoc standards may be used as a simplifying mechanism in evaluating information. Brand alternatives that appear attractive initially are likely to be examined further. In contrast, if a brand appears unattractive on one or two dimensions, reasonably that brand will not be chosen. In the latter case, the consumer may search other brands on the same or different attributes. Hence, if range knowledge affects search, there ultimately may be effects on the choices that consumers make.

Assar and Chakravarti (1984) also discussed the effects that range information may have on confidence in judgments and choices. For example, in the absence of the context provided by range knowledge, consumers may lower their evaluations to compensate for the associated uncertainty. Moreover, such effects are likely to be accentuated when the consumer is less familiar with the dimension of judgment.

Assar and Chakravarti (1984) used SLR cameras as the product class in their study. This ensured that their student subjects did not have much extra-experimental knowledge about the meaning of attributes and the range of values available in the environment. This permitted them to experimentally manipulate range knowledge.

Subjects were placed in three range knowledge conditions in this study. Range information was given on four attributes in two of these conditions (see Table 4-1). In the wide range condition, subjects were told that the range of attribute values was consistently three times wider than in the narrow range condition, the scales being anchored at the same center value. In the third condition, subjects were not given any range information at all.

All subjects first evaluated a profiled brand. The lens quality index score for this brand was placed at 40, towards the upper end of the narrow range (30-45) but not as high on the wide range (15-60). It was expected that this profiled brand would be evaluated most favorably in the narrow range condition, less favorably in the wide range condition, and least favorably when no attribute range knowledge was available. Subjects were also asked to provide a confidence rating associated with their evaluation. The expectation was that subjects would be more confident when range knowledge was available relative to when it was missing.

In a second task, requiring search, subjects were given a single "seed" brand-attribute value, the lens quality index of a brand. This was presented in a 3 x 3 brand x attribute matrix (see Table 4-2). The lens quality index value given was 45--the best available value on the narrow range. The top end of the narrow range was used because the expected effects on search were believed to be most likely at this level. Without range knowldege, the consumer was expected to have difficulty in evaluating the given value with confidence. Hence, the consumer was expected to search for other brands, to develop a context for interpreting the given brand-attribute value.

In the narrow range (i.e., 30 to 45) condition, the lens quality index score of 45 can be interpreted as the best available. This

Table 4-1
Range Pretest--Evaluation Task

Subjects were given this camera profile:
Max. shutter speed index = 1400
Price ($) = 325
Warranty (months) = 18
Lens quality index = 40

Rated the desirability of the profiled camera on a 9-point scale (1 = extremely undesirable, 9 = extremely desirable)

Rated confidence in this desirability rating (1 = not at all confident, 9 = extremely confident)

Attribute Range Knowedge Provided in the Wide and Narrow Range Conditions Only

Attribute	Range Condition	
	Wide Range	Narrow Range
Maximum Shutter Speed	500-2000	1000-1500
Price ($)	150-600	300-450
Warranty (months)	6-24	12-18
Lens Quality Index	15-60	30-45

Table 4-2
Range Pretest--Search Task

Subjects were asked to imagine they were in a camera store which stocked 3 brands (A, B, and C), all priced at $400 (to eliminate price as a search attribute).

The "seed" value given was lens quality index for B = 45 in matrix as shown.

	A	B	C
Max. shutter speed index			
Lens quality index		45	
Warranty period			

Subjects indicated which piece of information they wanted next by checking the appropriate cell on the matrix.

Subjects were asked to describe how this new item would be used. (Note: They did not actually get a new brand attribute value).

Finally, they were asked to indicate a second piece of information they wanted and how that would be used.

favorable provisional evaluation can be made without searching other brands. Hence, it was expected that the consumer would be more likely to search the given brand on other attributes, since it would be identified as a likely choice candidate.

In the wide range condition (i.e., 15 to 60), the provisional evaluation was still expected to be favorable but unlikely to be as extreme as before. The consumer's search patterns would be less predictable in this instance. The same brand could be examined further or the lens quality scores of other brands may be searched to locate a better brand. Alternatively, even other brands might be searched on other attributes.

Assar and Chakravarti (1984) found that, as expected, evaluation was higher for the narrow and wide range conditions and significantly lower for the no-range condition. This suggests that a lack of context may have led subjects to discount their evaluations. The profiled brand's evaluations were not different in the narrow and wide range conditions. Also, as expected, confidence ratings were lower and the variability of evaluation was higher in the absence of range information, relative to the two range conditions. Thus, the absence of a context led to uncertainty in evaluation.

In analyzing the search sequences, subjects who searched the two remaining pieces of brand B information (see Table 4-2) were classified as following a purely brand-based search pattern. Those who searched the remaining two pieces of lens quality information were classified as following a purely attribute-based search pattern. The analyses showed that, as expected, brandwise search was most frequent in the narrow range condition. There was no difference between the extents of brandwise search in the wide range condition and the condition where no range information was available. Attributewise search was hypothesized to be most likely in the no range case, less likely in the wide range case and least likely in the narrow range case. Here however, the range manipulation did not have a significant effect, though the proportions were ordered as predicted.

The data from this preliminary study supported the key elements of the proposed mechanism for how range knowledge affects evaluations and search behavior. The availability of range information may enable subjects to form preliminary evaluations which in turn may mediate search.

Issues for Research

The provocative findings of the preceding study suggest additional research to pin down the exact nature and locus of range knowledge effects. While the study showed how range knowledge-induced effects on provisional evaluation could mediate search (a behavioral criterion)--several design limitations constrained more explicit inferences regarding these effects. These are discussed below.

First, there is a need to examine alternative specific accounts of how range knowledge influences evaluations. Two competing accounts need to be resolved. In one, when range information is missing, consumers may experience uncertainty in evaluating a brand and may compensate by discounting their evaluations. Alternatively, when range information is not available as an evaluation context, subjects may be unwilling to make extreme evaluations. A brand with favorable characteristics may be evaluated less favorably in the absence of range knowledge than when it is present. However, a brand with unfavorable characteristics may receive a somewhat higher favorable evaluation in the absence of range information. This suggests that in the absence of range knowledge, evaluations may gravitate toward the middle of the response scale.

A study using brand-attribute values spanning the range of a dimension will allow separation between the explanation invoking the discounting of evaluations versus the case when subjects are unwilling to make extreme evaluations. When range information is not given, the pattern of ratings of low brand-attribute values will be diagnostic. The discounting explanation would suggest lower evaluations relative to those for the wide and narrow range conditions. On the other hand, higher evaluations for these brands will support the explanation that subjects are unwilling to make extreme evaluations.

Second, in the Assar-Chakravarti (1984) study, the brandwise search pattern was demonstrated only when the seed brand-attribute value was at the top end of the range. It remains to be seen how search patterns are affected by choice of the "seed" value. It may be that the extreme upper end of a range may serve as a psychological anchor (permitting a representation as the "best available") that leads to brand based search. This may not hold for values in the interior of the range that only permit less extreme favorable evaluations. Other possible psychological anchor points in a range also need to be explored. A study that uses other "seed" brand-attribute values will enable us to more comprehensively understand the way range knowledge is used by consumers in search.

The next chapter presents the experimental study conducted along the lines developed above. We manipulated range knowledge in a manner similar to the previous Assar-Chakravarti (1984) study--but this time studied the effects over alternative brand-attribute values that spanned the range of attribute values under consideration.

In passing, one might note that there are numerous possibilities for interesting studies on other aspects of range knowledge effects. For instance, in some circumstances, the same person may find two different ranges on the same attribute relevant. Suppose that the range of lens quality available in the environment is known to be 15 to 60. However, the set of available choice alternatives may be restricted (say between lens quality values of 30 and 45) if some alternatives are out of stock.

In such a situation, the consumer may use the ecologically available range (i.e., 15 to 60) to form an evaluation. Also, if the consumer is free to choose or to reject the entire set, this ecological range would affect search. A camera with a lens quality index of 45 may be seen as mediocre on that attribute, and that brand may not be considered for choice, nor searched further.

However, if the consumer must make a choice from what is available, the relevant range in the choice set may be used to form provisional evaluations. In this case the brand with the lens quality index of 45 may be seen as the best available. The evaluation in absolute terms (i.e., with respect to the ecological range) may be mediocre but the brand may still be searched and chosen.

These, and other interesting issues such as the effect on the use of range knowledge when search yields values outside a previously known range (See Meyer 1981, Hagerty and Aaker 1984), suggest issues warranting further study. However, such issues are outside the scope of the empirical work in this dissertation and are left for future research.

CHAPTER 5

AN EMPIRICAL INVESTIGATION OF ATTRIBUTE RANGE KNOWLEDGE EFFECTS: CONCEPTUAL HYPOTHESES AND STUDY DESIGN

The previous chapter outlined how a consumer's knowledge of attribute ranges in a product category may guide evaluation and search. It was proposed that the consumer may use range knowledge as a context to make provisional evaluations of brand attribute values encountered in a sequential search process. These provisional evaluations may then mediate patterns of sequential search for information. As a consequence of these processes, secondary effects may occur on the level of confidence that consumers have in their evaluations.

In this chapter, the proposed mechanism is developed more formally. First, a scenario is described in which range knowledge may affect provisional evaluations of a brand's attribute values. This is followed by a discussion of the impact of these evaluations on information search behavior. Alternative accounts of how these evalutions may occur are first discussed and corresponding formal hypotheses are presented. Next, the likely effects of these provisional evaluations on search are discussed along with formal hypotheses for the same. Finally, secondary effects on confidence in evaluations are hypothesized. These hypotheses are followed by the description of a study that was designed to test them.

Range Effects on Provisional Evaluations: A Proposed Mechanism

Very often, in complex and technically sophisticated product categories, consumers may have to deal with attributes that are difficult to comprehend or described using unfamiliar terminology. For example, many beginning amateur photographers may be considering the purchase of single-lens reflex (SLR) cameras that typically have a number of lens elements in the optical system. The consumer may be unable to assess the performance features of these elements, and even if some externally determined assessment is provided in the form of a "lens quality index, the consumer may not be able to comprehend or evaluate the meaning of this terminology by itself. Thus, if the consumer encounters an advertisement for an SLR camera that says that its lens quality index is 45, he or she may find it difficult to evaluate the given brand-attribute value and consequently be uncertain about what evaluation to attach to it.

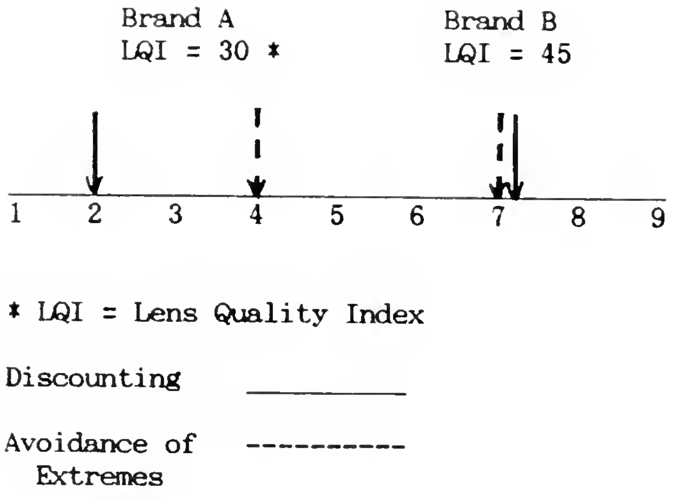
The Evaluation Mechanism

How consumers may deal with this uncertainty is not entirely clear. What is involved is the development and reporting of a subjective evaluation of an ill-comprehended piece of information. Although some findings have been equivocal between negative and neutral evaluations (e.g., Yamagishi and Hill 1983), much evidence suggests that the uncertainty may be viewed negatively in the context of the evaluation task and serve to lower the reported evaluations (e.g., Meyer 1981). In this case, the lens quality index score may receive a lower subjective evaluation in view of the fact that the attribute is not familiar and/or is poorly understood. This discounting behavior may be applied consistently regardless of the brand-attribute value presented.

Depending on the risks that the consumer perceives in the situation, one may alternatively argue that uncertainty could lead a consumer to avoid making extreme evaluations of information that is not fully comprehended. This tendency would reflect in moderate subjective provisional evaluations being formed and reported.

To illustrate these two alternatives, consider two SLR camera brands A and B with lens quality index ratings of, say, 30 and 45. A consumer who does not understand this scale may form subjective evaluations and report these on a 9 point scale as, say, 2 and 7 respectively, as in Fig. 5-1. Under the uniform discounting mechanism, both these responses would be lower than an evaluation that might be given if contextual information (such as range knowledge) were available for making the judgment. However, under the alternative mechanism, where the consumer was attempting to avoid forming and reporting extreme evaluations, one may expect the lower lens quality index of 30 to receive a rating of, say, 4, whereas the 45 may be rated as a 7 as before. Perhaps the mid-point of the scale or the end-points would serve as the natural anchors for these reported judgments.

The situation changes considerably when the consumer has knowledge of the range of lens quality index scores. This range then provides a scale on which any incoming brand-attribute value may be placed and evaluated. The available range information then serves as an evaluation yardstick. In the case where larger lens quality index values are better, larger attribute values are more likely to fall on the more



* LQI = Lens Quality Index

Figure 5-1
Alternative Evaluation Mechanisms

desirable part of the range, and should receive higher ratings. By the same token, smaller attribute values are likely to receive lower ratings. Attribute values in the middle of the range may receive moderate scores.

The arguments above have been presented intuitively. Past research (see Parducci 1965; Parducci and Perrett 1971) also suggests that the reported ratings may also be affected by the distribution of the brand-attribute values over the range and the number of response scale categories. By this argument, the ratings received would also vary by the width of the scale. Given a wide and a narrow scale centered at the same lens quality index score, evaluation of given brand-attribute values should differ systematically based on the mapping of the given attribute value to the natural anchors provided by the range knowledge.

Search Patterns Contingent on Overall Evaluation

In many judgment contexts, consumers may not have all the judgment-relevant information available at the same time. Sometimes, information items are acquired sequentially, following the acquisition of an initial "seed" item of brand-attribute information. As discussed above, range information enables the consumer to form a preliminary evaluation of the "seed" brand-attribute value. This evaluation may mediate search behavior. We will examine how this mediation process may develop as a function of range knowledge and the attribute value encountered.

First, we examine the case in which the consumer does not have knowledge of the available range of attribute values. To illustrate, consider the situation where the consumer wants to choose a camera from among three alternatives (say, A, B and C) for which information is available on three attributes--shutter speed, lens quality and warranty. Say the consumer learns that brand B has a lens quality index of 50. Since the consumer lacks a context, this seed brand-attribute value may be difficult to interpret. The consumer may then examine the lens quality index values of brands A and C to form some basis for evaluating the given brand-attribute value. Thus, in this situation, the consumer may search by attribute (i.e., look at other brands on the same attribute) to form a context for evaluating the seed value of the lens quality index for brand B. Note that this tendency for attribute based search will persist regardless of the level of the initial brand-attribute value.

When range knowledge is available, this information can be used to form a provisional evaluation of the brand. This provisional evaluation will mediate the subsequent pattern of search. Since the provisional evaluation will depend on the actual nature of the range knowledge as well as the level of the brand-attribute value encountered, we will examine several alternative cases.

First, consider the case where the seed value is a lens quality index score of 50 for brand B and the known range of lens quality index scores is, say, 30-50. In this particular case, the seed brand-attribute value may be coded as the "best available" and the brand would rate as a prime choice candidate on the basis of this provisional evaluation. Consequently, the next search is likely to be on the other attributes of the same brand, i.e., brand-based search (Assar and Chakravarti 1984).

If the known range were wider, say, 20-60 (but assumed to be centered at the same value of 40), the lens quality score of 50 would still be evaluated favorably, but this evaluation would not be as extreme as previously. Hence, while there is still a good chance that brand B will be searched further, there is a greater likelihood that the consumer may search the other brands (A and C) on the lens quality attribute to see whether they are better than B. Thus, in this particular case, there is likely to be a lower probability of brand-based search than in the previous case and a higher likelihood of attribute-based search.

The case where the lens quality index scores still range between 30 and 50 but where the seed attribute value is, say, 45, may be viewed similarly to the case just discussed. Since the evaluation is favorable, but not extreme, brand-based search is somewhat less likely and attribute-based search for a brand with a better lens quality index score is more likely to occur.

Thus, in summary, the search predictions are conditioned upon the favorableness of the provisional evaluation of the seed brand-attribute value. The more extreme the favorable provisional evaluation of a given seed brand-attribute value (given the known range of attribute scores), the more likely is brand-based search. The likelihood of brand-based search will decline for lower brand-attribute values as the provisional evaluations become less favorable. The propensity to search by attribute should rise correspondingly.

It should be noted that predictions regarding the wide versus narrow range effects are made using the logic above and implicitly assume that the two ranges are centered at the same value. When this is not the case, the specific evaluation and search predictions would nevertheless be based on the location of the seed brand-attribute value relative to the known range of attribute values. Thus, if the "wide" range were defined by lens quality index scores of 30 and 80, the brand-attribute values of 50 and 45 would both receive low provisional evaluations.

In the next section, we state the formal hypotheses regarding attribute range knowledge effects that follow from the mechanism proposed.

Conceptual Hypotheses

The mechanism proposed in the previous section serves as the basis for the conceptual hypotheses stated here. We first propose a set of hypotheses concerning the nature of provisional evaluations formed as a result of range knowledge. Next, we present hypotheses concerning the nature of search and finally, we present hypotheses regarding secondary effects of range knowledge on the confidence associated with the evaluations made by consumers.

Effects on Evaluations

The conceptual hypotheses in this section will contrast two situations. First, we will discuss how evaluations may vary when range knowledge is absent versus when it is present. The contending issues here are whether, in the absence of range knowledge, consumers uniformly discount evaluations or whether they avoid making extreme evaluations and "gravitate" toward the center of the response scale. Thus, for larger brand-attribute values, the predicted evaluations will be similar under the two mechanisms. However, for smaller brand-attribute values, the predictions will be different. Under the uniform discounting mechanism, these evaluations will be uniformly lower relative to when range information is available. Under the latter mechanism, one may expect larger brand-attribute values to be rated lower but smaller brand-attribute values to be rated higher (see Fig. 5-2).

The consistent discounting mechanism suggests the following formal hypothesis:

> H1: When range information is not available for an attribute, all levels of brand values on that attribute will be rated lower or equal relative to when the range information is available.

The following hypothesis is consistent with the tendency to avoid extreme evaluations:

> H2: When range information is not available for an attribute, favorable brand-attribute values will be rated lower relative to when range information is available whereas unfavorable brand-attribute values will receive higher ratings than when range information is available.

Second, we will discuss the manner in which evaluations of different levels of brand values of an attribute may vary when the known range of attribute values is either wide or narrow. As previously discussed, the predictions are based on a consideration of how the given attribute value is mapped on to the known range of attribute values using the natural anchors provided by the range knowledge.

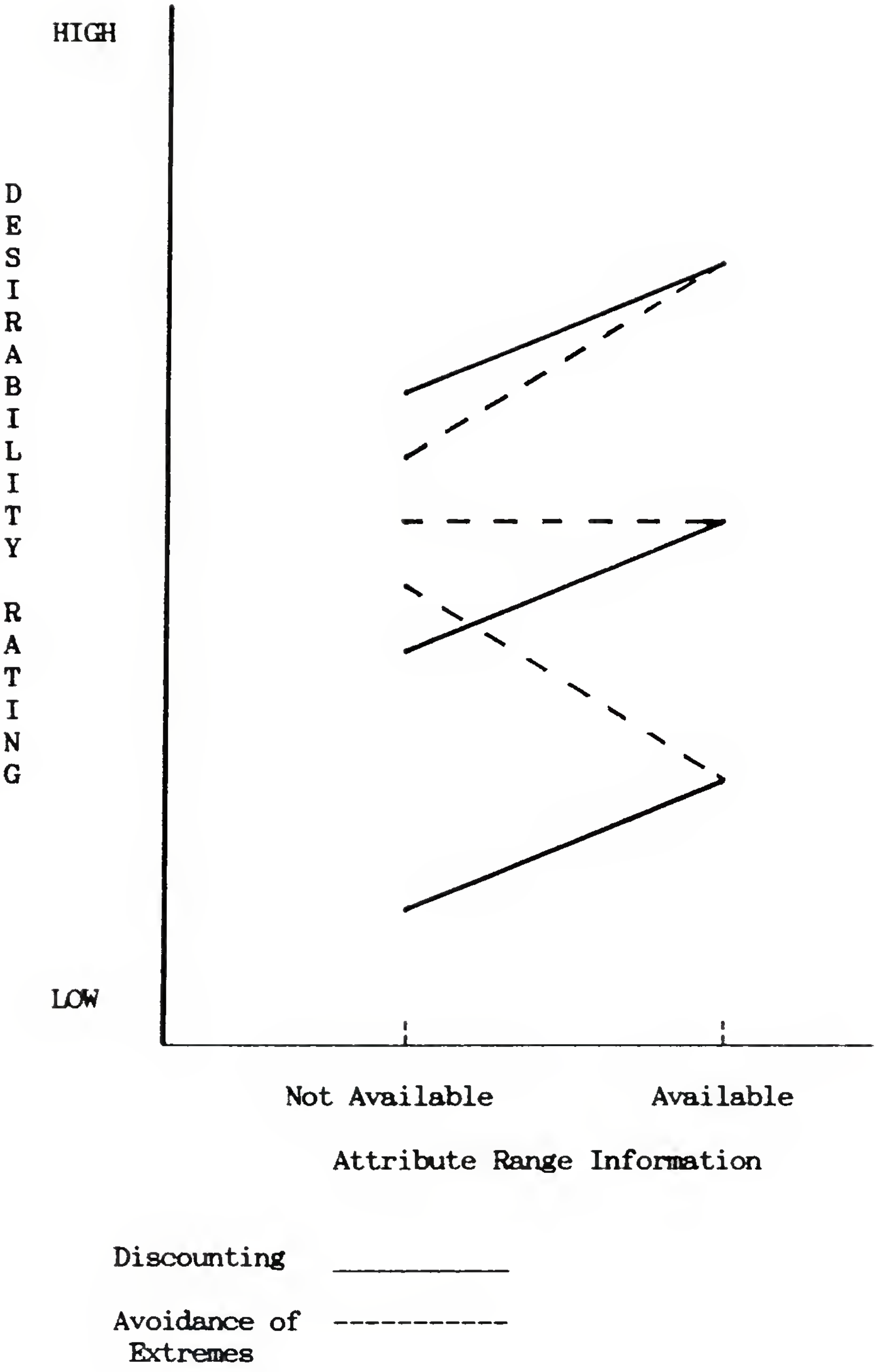


Figure 5-2
Evaluation Patterns as a Function of Availability of Attribute Range Information

We start with the case where the given brand-attribute value is at the extremes (end-points) of the known range of attribute values. In both the wide and the narrow range conditions, the value may be evaluated as the best (worst) available, permitting an unequivocal and invariant evaluation. While variations in response language (Wyer 1974) may affect the judgment as reported on a given response scale, this is unlikely to be a function of the width of the range. Thus we state the following hypothesis:

H3a: Evaluations assigned to brand-attribute values at the extremes of a known range of attribute values will not differ whether the known range is narrow or wide.

However, for brand-attribute values in the interior of the known range of attribute values, the mappings are likely to be more extreme when the range is narrow versus when it is wide. Of course, this is contingent upon the wide and narrow ranges being identically centered. Stated formally, this translates to the following hypothesis:

H3b: Brand-attribute values in the interior of a known range of attribute values will receive more extreme ratings when the range is narrow relative to when it is wide.

Effects on Search

The provisional evaluations hypothesized above will mediate the patterns of sequential search. As we have argued earlier, in the absence of range information, a given brand-attribute value cannot be evaluated with confidence. As a consequence, the consumer may attempt to generate a context for the provisional evaluation. This may be achieved if other brands are searched on the same attribute--i.e., by conducting an attribute-based search. This does not preclude search on other better understood attributes of the same brand. However, other things being equal, there is greater likelihood of attribute-based search when range knowledge is not available. Thus, we have the following hypothesis pertaining to a sequential search scenario:

H4: Attribute based search is more likely (all other things being equal) when no range information is available relative to when range information is available.

Since the provisional evaluations formed when range knowledge is available will vary depending on the width of the range and upon the location of the brand-attribute value on this range, our hypotheses in this regard must be predicated upon these factors.

We first consider the case where the brand-attribute values are favorable (i.e., located at either the extreme or the higher parts of the known range of brand-attribute values). When the "seed" brand-attribute value is at the favorable extreme of the range, the brand is likely to be seen as dominating other brands on that attribute. Thus, if the brand's attribute value is coded as the "best available" on the given attribute, the consumer would tend to search the same brand to see if its other attribute scores are also acceptable. A similar reasoning may also be used to make predictions favoring brand-based search when the "seed" brand-attribute value takes on other generally favorable values in the interior of the known range of attribute values.

We note the possibility that brand-based search may occur only when the seed brand-attribute value is placed at the upper extreme (i.e., when the seed brand is perceived as dominant on that attribute). The tendency to search by brand may not be observed for brand-attribute values that do not permit this "dominant" encoding. Hence, whether or not brand-based search occurs at values in the favorable interior of the range provides insights regarding the relationship between the subjective or psychological evaluation of the brand-attribute value and a behavioral criterion such as search. We next consider the cases where the seed brand attribute values are mediocre or poor (fall in the middle or lower part of the known range). Here, the consumer may examine other brands that may be better than the given one on the same attribute, or he or she may examine other attributes. However, the same brand is less likely to be examined if its provisional evaluation on an attribute is mediocre or poor. In fact, the poorer this provisional evaluation, the less likely is brand-based search to occur as the brand may be provisionally dropped from the choice set. Finally, since strongly affirmative favorable evaluations are unlikely when no range information is available, brand-based search is likely to remain low and also not vary as much with the brand-attribute value location. These considerations suggest the folowing hypothesis:

H5: When range knowledge is available, brand-based search is more likely for brand-attribute values located at favorable portions of the scale than for values located in the middle and the unfavorable portion of the ranges. In contrast, in the absence of range knowledge, the level of brand-based search is likely to remain invariant as brand-attribute values become more favorable.

Finally, we will examine the impact on search of the width of the known range of attribute values. Our predictions regarding the effect of range width on the preliminary evaluations were that the narrower range would elicit more extreme provisional evaluations of the seed brand-attribute values. The logical implications of these assertions suggest the following three formal hypotheses:

H6a: Brand-based search is equally likely when the seed brand-attribute value is located at the upper extreme of the known range of attribute values regardless of whether the range is narrow or wide.

H6b: Brand-based search is more likely when the known attribute range is narrow rather than wide for brand-attribute values that are located at the higher but interior portion of the known range.

H6c: Attribute-based search is more likely for brand-attribute values that are located at the middle and lower portions of the known range of attribute values when the known range is narrow versus wide.

Secondary Effects on Confidence in Evaluations

In our discussions of the likely effects of range knowledge on evaluations, we proposed that when range information is not available, consumers may be uncertain regarding their evaluations. When range knowledge is made available, this uncertainty is significantly removed. This is likely to happen regardless of whether the known range of attribute values is wide or narrow. Consequently, we state the following two hypotheses:

H7a: Relative to when range knowledge is not available, greater confidence will be held in evaluations when information is available about the range of attribute values.

H7b: The width of the known range of attribute values will not affect confidence in evaluations.

Finally, it may be noted the brand-attribute values located at the extremes of a known range permit stronger inferences such as "the best available" or "the worst available." Brand-attribute values in the interior of the range do not permit such inferences. Hence, we state the following hypothesis:

H8: Greater confidence will be associated with evaluations of brand-attribute values at the extremes of the known range than with values in the interior of the range.

Special Cases: Attribute Values Violating Range Expectations

One related issue that is of interest relates to what happens when a brand-attribute value is encountered that falls outside the consumer's known range of available attribute values. For example, consider a consumer who has prior knowledge that the range of lens quality index scores for an SLR camera is 30-50. Now consider a situation where this consumer encounters a brand with a lens quality index of 55. In this case, the consumer may merely update range knowledge as 30-55 and evaluate the given brand higher than or equal to the rating it would have received had range expectations not been violated. Similarly, a brand with a lens quality index of 25 would be evaluated lower or the same as if range expectations were not violated. Also, the consumer may then update the range knowledge as 25-50. In both these cases, the essential credibility of the original range information is not challenged by the consumer. These arguments constitute the null hypothesis regarding the effects of range violations. Further, if the consumer perceives little risk in giving a low evaluation, the above effects would be reinforced.

However, the possibility remains that encountering brand values that are outside the previously known range raises questions about the credibility of the range information. The uncertainty created as a consequence may impact upon the evaluation of the brand-attribute value and also the confidence with which this evaluation is held. The following two hypotheses stem from the above reasoning and are the alternative hypotheses regarding the effects of range violations.

H9a: A brand-attribute value that is higher than a previously known range of available attribute values will receive a lower rating than it would if it were at the upper extreme of a known range of available attribute values.

While the above is consistent with an evaluation discounting hypothesis, we will argue that when expectations are violated at the lower end, consumers may avoid providing extreme evaluations. Thus, we have the following hypothesis:

H9b: A brand-attribute value that is lower than a previously known range of available attribute values will receive a higher rating than it would if it were at the lower extreme of a known range of available attribute values.

On the other hand, when expectations are violated at the lower end, if the evaluation discounting mechanism is operating, then the predicted effect would be in the opposite direction. Hence Hypothesis 9b could have been restated such that a brand-attribute value lower than a previously known range of available attribute values would receive a lower rating than it would if it were at the lower extreme of a known range of available attribute values.

Since range knowledge violations of any kind are likely to increase uncertainty, the confidence in evaluations is likely to be lowered. Stated formally, we have:

H10: The confidence associated with the evaluation of a brand-attribute value that violates a known range will be lower than if this brand-attribute value did not violate the known range.

Finally, we examine how sequential search patterns may be affected when an encountered brand-attribute value violates a previously known range of attribute values. Corresponding to the null hypothesis effect of no significant effect on the credibility of the range information, one would expect the provisional evaluations to remain essentially unaffected. In this case, no significant changes may be expected from the predictions in hypotheses H5 and H6.

However, if the violation of the expected range affects the credibility of the range knowledge, the consumer may behave as if the range information were not available. This may enhance the likelihood of an attribute-based search as the consumer attempts to develop a new context for the evaluation of the given brand-attribute value. This alternative hypothesis is stated formally below:

H11: When consumers encounter a brand-attribute value that violates the previously known range of values on an attribute (either at the higher or the lower end), the likelihood of attribute-based search will be greater relative to when this brand-attribute value did not violate the range expectations.

In summary, this section has offered hypotheses regarding the effects of the absence/presence and violations of previously known ranges of attribute values in a product category. These hypotheses pertained to the effects on provisional evaluations of a brand-attribute value, to how these provisional evaluations may mediate sequential search patterns and to secondary effects on confidence. In the next section we describe the study that tested these hypotheses.

Experimental Method

The preceding hypotheses were tested in an experiment that manipulated range knowledge at three levels (no range information, wide range and narrow range respectively), and seven brand-attribute value locations. Thus there were 21 conditions in all in this between-subjects design. In each condition, subjects performed two tasks. In the first task, they indicated how they would search in a 3x3 brand-attribute matrix, given one of the seven brand-attribute values as "seed" information and the appropriate range knowledge condition. In the second task, they judged a brand profile incorporating the given brand-attribute value in the context of the (un)available range information. They also provided confidence ratings associated with these judgments. Dependent measures used to test the search hypotheses were computed from the first task. The second task provided the data used to test the evaluation and confidence hypotheses.

Subjects

A total of 420 subjects were used. The subjects were students drawn from undergraduate and M.B.A. classes at SUNY Binghamton during the Spring 1987 term. The average age of the subjects was 22.2 years. 50% of the subjects were male. Data from an additional 26 subjects were discarded due to their failure to comply with task instructions. Subjects were eligible to participate in a random drawing for cash prizes. The procedures were administered in 12 groups of size ranging from 5 to 79.

Stimuli

Single lens reflex (SLR) cameras were used as the product category. Prior experience and pre-tests with convenience samples of undergraduate students showed that most subjects had low levels of general familiarity with SLR cameras (Assar and Chakravarti 1984). This was desirable so that both attribute scales and the ranges of values on these scales could be manipulated without being over-ridden by the extra-experimental anchors that subjects may possess.

Prior experience also suggested that the technical attributes of SLR cameras, such as shutter speed and lens quality, were amenable to credible range manipulations since most subjects were relatively unfamiliar with the associated terminology. Attributes such as price and warranty, on the other hand, were easily comprehended and less amenable to credible range manipulations. Thus, to the extent that attribute range knowledge manipulation is one type of a judgment context manipulation (see Chakravarti and Lynch 1983), attributes unfamiliar to the subject sample were chosen to ensure effective manipulations.

Procedure

Subjects were assigned randomly to the 21 experimental conditions. They first received orienting instructions where they were asked to assume that they were purchasing an SLR camera for a friend overseas. According to the friend's instructions, the cameras were to be examined on four features: maximum shutter speed, price, warranty period and lens quality, each to be weighted equally. The introduction sheets for each condition (Appendices 1-3) provided information on each attribute.

The range knowledge manipulation

The three level range knowledge manipulation was embedded in the orienting instructions. The description of each attribute provided (hypothetical) low and high values for each SLR camera attribute in the two conditions where attribute range knowledge was available. This information was entirely omitted in the third (no range information) condition.

For maximum shutter speed, price and warranty, the ranges of values indicated were held constant for both levels where range knowledge was available. The manipulation itself was operationalized by varying the indicated ranges for the lens quality index attribute. In the Wide Range (W) condition, subjects were told that the lens quality index scores for SLR cameras ranged from a low of 25 to a high of 55. In the Narrow Range (N) condition, the low and high extremes were stated as 30 and 50 respectively. Thus, while both the W and the N ranges were centered at 40, the W range was 50% larger than the N range on the hypothetical lens quality index scale. In the third condition, (O), no range information was provided as previously stated.

The brand-attribute value manipulation

A total of seven different lens quality index scores (25, 30, 35, 40, 45, 50 and 55) were used in the manipulation of brand-attribute value locations. In the no-range information (O) condition, these were judged context-free. In the wide range (W) condition, the specified range of lens quality index scores was 25-55. Thus, brand-attribute values were located at seven equally-spaced points over the entire range. In the narrow range (N) condition, the specified range of lens quality index scores was 30-50. Thus, the brand-attribute values were located at five equally-spaced points over this range. However, in addition, the lens quality index scores of 25 and 55 were the conditions in which the range knowledge was violated. These brand-attribute values were used in the search and evaluation tasks that are described next.

The search task

Following the orienting instructions that embedded the range knowledge manipulations, subjects performed a search task. They were told to imagine that they were in a store looking for a camera for their friend. The store had three equally-priced cameras (A, B and C) that were within the friend's budget. Equating the prices of the three cameras removed price as a determinant attribute.

Subjects next saw a 3x3 brand by attribute matrix (see Table 5-1) with spaces for the three brands' (A, B and C) scores on maximum shutter speed, lens quality index and warranty. Only one item of information (the lens quality index of brand B) was entered in the central cell of this matrix. For each condition, one of the seven levels of the brand-attribute value manipulation was used.

Given the single "seed" item of brand-attribute information, subjects were asked to indicate the next item of information they would acquire by placing a check mark in the appropriate cell of the 3x3 matrix. They were also asked to briefly describe in writing how this new piece of information would be used. Note that locating the "seed" brand-attribute value in the center of the matrix avoided potential response biases that may have stemmed from other alternative formats in which the question may have been asked. Following this, subjects were again asked to indicate a second item of information that they would look for, and also to describe how this would be used. No information was actually given to the subject to avoid complex search patterns contingent on the actual value of the information obtained. Thus, these data captured the first two steps in a sequential search strategy developed based upon the location of the "seed" brand-attribute value and the nature of range knowledge made available to the subjects.

The evaluation task and confidence judgments

Following completion of the search task, subjects were asked to review the orienting instructions. They were next asked to examine an SLR camera profile that had maximum shutter speed of 1600, a price of $325, a 9 month warranty and a lens quality index score set at the level used previously in the search task. Subjects judged the desirability of the profiled brand on a 9-point scale (1 = Extremely

Undesirable and 9 = Extremely Desirable) and indicated their confidence in this desirability rating on a 9-point scale (1 = Not at all Confident and 9 = Extremely Confident).

The profiled brand was chosen to have generally favorable values for the three attributes for which scores were fixed for all subjects. The maximum shutter speed score of 1600 was somewhat higher than the center of the stated range of 1000-1800; price was set at $325, slightly above the center of the stated range of $200-$400 and the warranty was set at 9 months at the center of the stated range of 6-12 months. These values were expected to generate moderately desirable ratings that would then track the manipulation of the lens quality index score. Table 5-1 provides a summary of the key manipulations.

Task evaluations and manipulation checks

Following completion of the search and evaluation tasks, subjects filled out a brief questionnaire (see Appendices 1-3). The questions concerned (1) perceived task realism, (2) perceived reliability of the information provided in the study, (3) SLR camera ownership, (4) knowledge of SLR camera attributes, (5) manipulation checks and (6) subject demographics. Subjects were debriefed following completion of the questionnaire. The entire procedure took an average of 25 minutes.

In summary, this chapter presented a discussion of the mechanism by which attribute range knowledge may influence provisional evaluations of brand-attribute information and mediate search. Hypotheses were stated regarding the nature of these effects and also on secondary effects such as those on confidence judgments. The design and procedural details of an experiment designed to test these hypotheses were described. The next chapter presents the findings of this study and discusses the implications of these findings.

Table 5-1
Key Manipulations

A. The Range Manipulations

1. Maximum Shutter Speed	(index)	1000-1800	
2. Price	($)	200-400	
3. Warranty Period	(months)	6-12	
4. Lens Quality	(index)	25-55	Wide Range
		30-50	Narrow Range

B. Example of Brand-Attribute Matrix for Search Task

	A	B	C
Max. Shutter Speed Index			
Lens Quality Index		55	
Warranty Period			

C. Example of Brand Profile Used for Judgment Task

Maximum Shutter Speed	(index)	1600
Price	($)	325
Warranty Period	(months)	9
Lens Quality	(index)	55

CHAPTER 6

AN EMPIRICAL INVESTIGATION OF ATTRIBUTE RANGE KNOWLEDGE EFFECTS: FINDINGS AND DISCUSSION

This chapter presents the findings of the previously described empirical study on the effects of attribute range knowledge in a product category. The data collected in the experiment were analyzed at the State University of New York at Binghamton, on the IBM 4381 mainframe computer. The software utilized was Statistical Analysis System (SAS) Release 5.08 (1984), from SAS Institute, Cary, North Carolina.

The chapter contains six sections. The first section presents some preliminary validity checks on (1) task perceptions, (2) subject characteristics pertaining to camera ownership and knowledge of terminology about SLR cameras and (3) the effectiveness of the range manipulation. The second section presents the tests of Hypotheses H1-H3 concerning how range knowledge manipulations affect the evaluations of a profiled brand. The third section presents the tests of Hypotheses H4-H6 about range knowledge effects on information search. The fourth section covers tests of Hypotheses H7-H8 on range knowledge effects on confidence in evaluations. The fifth section deals with the results for Hypotheses H9, H10 and H11. These results relate to the effects on evaluations, search and confidence when attribute values that violate prior range knowledge are encountered. The final section summarizes these findings and discusses their conceptual and practical implications.

Preliminary Validity Checks

Data for the tests reported in this section were drawn from the questionnaires that subjects completed following the search and evaluation tasks.

Task Perception Measures

Two self-report measures were used to assess subjects' perceptions of the realism of the experimental task. Subjects used 9-point rating scales (1 = "quite unrealistic" and 9 = "quite realistic") to rate the realism of making a "purchase" based on a description, and the realism of the brand that they were asked to evaluate.

Making a purchase based on a description received a mean realism rating of 5.06. These perceptions were significantly affected by the range manipulation ($F(2,399) = 7.32$, $p < .0008$). The means were 5.16, 5.46 and 4.55 in the wide, narrow and no-range conditions respectively. Thus, the task in the no-range condition was rated as significantly less realistic than in the wide and narrow range conditions ($p < .05$ in a Tukey test). But the means for the wide and narrow range conditions did not differ from each other.

The profiled SLR camera brands received an overall realism rating of 5.22. As before, there was a significant effect of the range manipulation ($F(2,399) = 30.06$, $p < .0001$). The means were 5.61, 5.83 and 4.23 in the wide, narrow and no-range conditions respectively. Thus the profiled brands were rated as less realistic in the no-range condition relative to the wide and narrow range conditions ($p < .05$ in a Tukey test). However, the brands were not rated differently in the wide and narrow range conditions.

Thus, the experimental task and the profiled brand were perceived as realistic when range information was made available. The absence of the range knowledge context affected the realism ratings for both the experimental task and the profiled brand, perhaps as a function of the same uncertainty that was postulated to affect evaluations and the confidence ratings. These results are reassuring on the mundane realism issue and also serve as an incidental validation of the effectiveness of the range manipulation.

Camera Ownership and Knowledge of Relevant Attributes

Only 31% of the subjects reported owning an SLR camera. Thus most subjects were not likely to have much knowledge of the product class. A self-report measure was used to assess subjects' understanding of terminology, relative to the average camera buyer. A nine-point scale was used (1 = "much worse" and 9 = "much better"). Subjects' overall ratings for understanding of terms were as follows: 4.53 for maximum shutter speed, 5.35 for price, 5.17 for warranty and 4.00 for lens quality. Thus, relative to the familiar, general attributes such as price and warranty, maximum shutter speed and lens quality were less well understood. As desired, the manipulated attribute, lens quality index had the lowest comprehension score. Moreover, no significant differences were found between groups in the brand-attribute value x Range design in a MANOVA analysis for the four terminology comprehension measures.

In summary, the low incidence of SLR camera ownership and self-reports of only moderate familiarity with the terminology related to the product category suggest that the range manipulation was not swamped by subjects' extra-experimental knowledge in the various groups of the study.

Turning to the next check, subjects rated the extent to which they perceived brand differences existed between SLR cameras on maximum shutter speed, price, warranty and lens quality. A nine-point scale was used, with endpoints labeled "brands do not differ much" (1) and "brands differ a lot" (9). The overall ratings for subjects' perceptions of brand differences were as follows: 5.23 for maximum shutter speed, 6.47 for price, 5.00 for warranty and 5.98 for lens quality index. Thus, subjects in fact perceived brands to be different on the four features considered.

Note that the ranges given were in fact the same for wide and narrow range conditions on three attributes, and differed only on the lens quality attribute. Also, the wide range on lens quality (25 to 55) was only 1.5 times the width of the narrow range (30 to 50). In the no-range condition, subjects did not have any information on which to base a judgment of the extent of brand differences.

Subjects' perceptions of differences between brands were tested separately for the four attributes. As expected, range information did not have significant effects for maximum shutter speed, price and warranty.

For the lens quality index attribute, the ratings for subjects' perceptions of brand differences were 5.84, 6.09 and 6.01 in the wide, narrow and no-range cases respectively. Range information did not have a statistically significant effect ($p > 0.45$).

Subjects also rated the usefulness of the information given to them, in evaluating the profiled brand. This was measured on a nine-point scale (1 = "not at all useful" and 9 = "very useful"). The mean usefulness rating was 5.22 and varied significantly by the range manipulation (F(2, 399) = 42.41, p < .0001). The means were 5.79, 5.97 and 3.91 in the wide, narrow and no-range cases respectively. The mean in the no-range condition was significantly lower than the means in the wide and narrow range conditions (p < .05 in a Tukey test), but the latter means did not differ from each other. This shows that the range manipulation was effective in that the range information was perceived to add to the usefulness of the information provided in the study.

Tests of the Evaluation Hypotheses

The evaluation hypotheses were tested by submitting the subjects' ratings of the profiled brand described in Chapter 5 to an analysis of variance as a function of the 3-level range knowledge manipulation, the seven-level brand-attribute value manipulation and the two way interaction term. The results of this aggregate analysis are shown in Table 6-1. Statistically significant effects were found for Range (F(2,399) = 6.26, p < .0021), brand-attribute value (F(6,399) = 18.58, p < .0001) and for the brand-attribute value x Range interaction (F (12,399) = 4.15, p < .0001).

The mean desirability ratings presented by study condition are in Table 6-1 and the data are plotted in Fig. 6-1. The graph generally shows a fan-shaped interaction suggesting a rather complex pattern of evaluations across the study conditions. Since the mean desirability ratings ranged between 4.3 and 7.45 on a 1-9 scale, no floor or ceiling

Table 6-1
Mean Desirability Ratings by Condition

Brand Attribute Value (Lens Quality)	Wide Range	Narrow Range	No Range Info	Mean
55	7.30	7.45	6.35	7.03
50	7.15	7.30	5.65	6.70
45	7.15	7.05	5.95	6.72
40	6.70	6.65	5.75	6.37
35	6.20	5.80	5.75	5.92
30	5.15	4.95	5.60	5.23
25	5.25	4.30	5.95	5.17
Mean	6.41	6.21	5.86	6.16

ANOVA

Source	Sum of Squares	df	F	p > F
BAV*	198.69	6	18.58	.0001
Range	22.31	2	6.26	.0021
BAV x Range	88.70	12	4.15	.0001
Error	711.30	399		

BAV* = Brand-attribute value

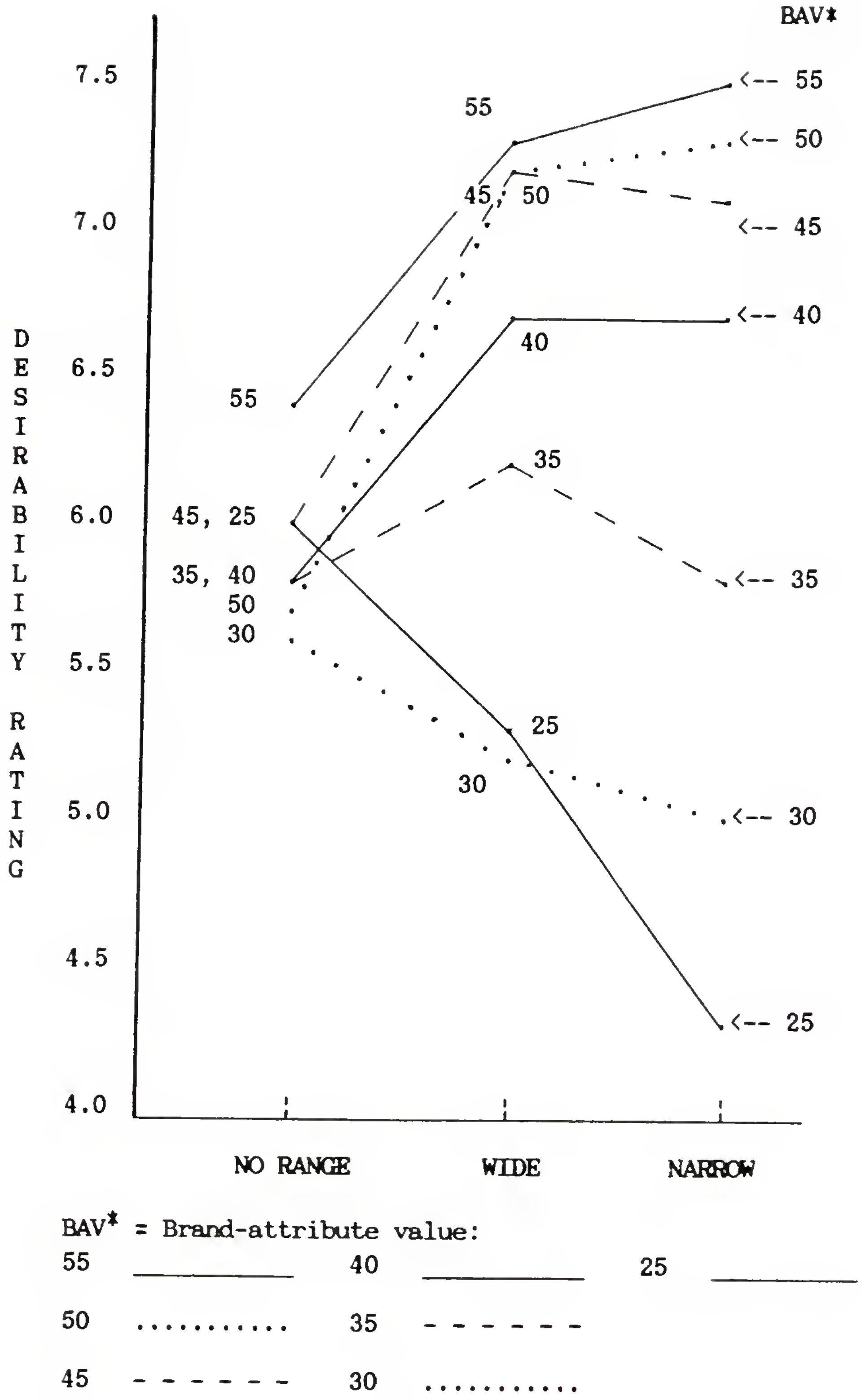


Figure 6-1
Graph of Mean Desirability Ratings
by Study Condition

effects seem to have occured. We will now analyze these data to check for the specific patterns related to each hypothesis.

Hypothesis H1 suggested that when range information is not available for an attribute, all levels of brand values on that attribute will be rated lower or equal to when range information is available. In contrast, hypothesis H2 argued that there would be a tendency to avoid extreme evaluations. In other words, in the absence of range information, only the larger brand-attribute values would be rated lower whereas the smaller brand-attribute values would actually receive higher ratings relative to when range information is available.

To test these hypotheses, the simple effects of the range manipulation at the various brand-attribute value locations were first examined. These contrasts are shown in Table 6-2. The tests show that the range factor had statistically significant effects for the brand-attribute values of 55, 50, 45, 40 and 25. No significant differences were noted for brand-attribute values of 35 and 30. Guided by these analyses, the desirability ratings in the wide and narrow range conditions were pooled and contrasted to the no-range condition.

These single degree of freedom contrasts are shown in Table 6-3. As the pattern of differences shows, brand-attribute values of 55, 50, 45 and 40 received significantly lower desirability ratings when range information was not available. However, the ratings were not significantly different for brand-attribute values of 35 and 30. In fact, the brand-attribute value of 30 was rated higher when range was not known. Finally, the rating for the brand-attribute value of 25 was

Table 6-2
Simple Effects of Range on Desirability Ratings

Contrast	Sum of Squares	df	F	p > F
Range at BAV=55	14.23	2	3.99	.0192
BAV=50	33.30	2	9.34	.0001
BAV=45	17.73	2	4.97	.0074
BAV=40	11.43	2	3.21	.0415
BAV=35	2.43	2	0.68	.5059
BAV=30	4.43	2	1.24	.2895
BAV=25	27.43	2	7.69	.0005

Table 6-3
Simple Effects of Availability of Range Knowledge on Desirability Ratings

BAV Location	Means Pooled Wide & Narrow	 No Range Information	Difference	Sum of Squares	df	F	p > F
55	7.38*	6.35	1.03	14.01	1	7.86	.0053
50	7.23	5.65	1.58	33.08	1	18.55	.0001
45	7.10	5.95	1.15	17.63	1	9.89	.0018
40	6.68	5.75	0.93	11.40	1	6.40	.0118
35	6.00	5.75	0.25	0.83	1	0.47	.4946
30	5.05	5.60	-0.55	4.03	1	2.26	.1333
25	4.78*	5.95	-1.17	18.41	1	10.33	.0014

Note: * Brand-attribute value was outside the expected range in the Narrow range condition.

significantly higher in the absence of range information than when range information was available.

These data are not consistent with the pattern predicted in Hypothesis H1 and are partially supportive of Hypothesis H2, suggesting a tendency to avoid using extreme evaluations when range knowledge is not available. It should however be noted that the brand-attribute values of 55 and 25 in the narrow range condition violated the expected range.

The rating for the brand-attribute value of 55 was significantly lower in the absence of range information than when range was known to be wide ($p < 0.05$). The rating for the brand-attribute value of 25 was marginally higher in the absence of range information than when range was known to be wide ($p < 0.1$).

When attribute range information is available, the evaluation of a given brand-attribute value was expected to differ, depending on whether the known range of values was wide or narrow. Hypothesis 3a stated that brand-attribute values located at the extremes of either the wide or the narrow range will not receive different evaluations. Hypothesis 3b argued that brand-attribute values in the interior of the known range will receive more extreme ratings when the range is narrow, compared to when it is wide.

Testing these hypotheses involves pairwise comparisons of the ratings assigned to the various brand-attribute value locations in the wide and narrow range conditions. In testing Hypothesis 3a, one must remember that the upper extreme lens quality index values are 55 and 50 respectively in the wide and narrow range condition. (The lens quality index score of 55 was outside the expected range in the narrow condition). As Table 6-1 shows, the profile with lens quality = 55 in the wide range case and the profile with lens quality = 50 in the narrow range case received identical desirability ratings of 7.3. This is clearly consistent with Hypothesis 3a.

Similarly, the lower extreme lens quality index values were 25 and 30 respectively in the wide and narrow range knowledge conditions. (As before, the lens quality index score of 25 was outside the expected range in the narrow range condition). As Table 6-1 shows, the profile with lens quality = 25 in the wide range case received a rating of 5.25 whereas the profile with lens quality = 30 in the narrow range case was rated as 4.95. These ratings also did not differ significantly ($p > 0.45$). This is also consistent with Hypothesis 3a. However, one should note that the tests of equality are essentially null hypothesis tests.

In testing Hypothesis 3b, it is necessary to arrive at an operational definition of the term "interior values." In the narrow range condition, the interior values are the lens quality index scores of 35, 40 and 45. For the wide range condition, these interior values are the lens quality index scores of 30, 35, 40, 45 and 50. Depending on how one lines up these values, several different tests may be conducted. In the three directly comparable cases (35, 40 and 45), no significant differences were found. The lens quality index value of 35 was rated as 5.80 in the narrow range condition and 6.20 in the wide range condition. These ratings were not significantly different ($p > 0.3$) even though they were in the right direction. The lens quality index of 40 received virtually identical ratings of 6.7 and 6.65 in the wide and narrow range condition ($p > 0.9$) and the ratings for the lens quality index score of 45 were 7.15 and 7.05 in the wide and narrow range conditions respectively ($p > 0.8$).

Thus, these data do not support Hypothesis 3b. As Table 6-1 shows, the other relevant comparisons (e.g., aligning the lens quality index value of 35 in the narrow range to 30 in the wide range) also do not show patterns consistent with Hypothesis 3b.

In summary, the above results show that range knowledge does have a significant impact on the desirability ratings assigned to brand-attribute values. The data show that in the absence of range information, evaluations tend to be less extreme. Thus higher brand-attribute values are rated lower and lower brand-attribute values receive higher ratings. It was also found that as expected the evaluations assigned to extreme brand-attribute values do not differ by the width of the known range.

The hypothesized more extreme ratings of interior values in the narrow range condition did not materialize. Perhaps the pattern of differences may have been accentuated had the wide range been very much wider than the narrow range. However, in the context of the present study, the data suggest that it is the availability of range information rather than the specific width of the range that affects evaluations.

Tests of the Search Hypotheses

The set of hypotheses on search were tested using dependent measures computed from the sequential search data. The observed search sequences were coded as follows. Those subjects who searched the two remaining pieces of brand B information (see Appendix 4) were classified as following a purely brand based initial search pattern. Similarly, those subjects who searched the two remaining pieces of lens quality information for brands A and C were classified as following a purely attribute based search pattern. The remaining subjects were classified as following other mixed strategies. The probability of either pure search sequence being observed by chance is low (i.e. 2/56, or approximately .035).

Table 6-4 shows the frequencies of purely attribute- (AA) and purely brand-based (BB) search patterns observed in each cell of the study. Figures 6-2 and 6-3 show plots of these search frequencies. The search hypotheses were tested by conducting log-linear analyses of (1) the brand-based versus all other search patterns and (2) the attribute-based versus all other search patterns as a function of the range and brand-attribute value manipulations and their 2-way interaction.

In Table 6-4, consider the 20 subjects given brand-attribute value = 25, in the wide range condition. Pure brandwise search was done by 1 subject, pure attributewise search by 13 subjects, and other patterns were used by the remaining 6 subjects.

These observed frequencies were combined to get the frequencies as in (1) and (2) above. These were then converted to logits which were used as the dependent variable for the CATMOD procedure in SAS.

The aggregate results of these analyses are shown in Table 6-5. The analysis of brand-based search frequencies showed only a significant effect of the brand-attribute value manipulation ($p < .001$). The range manipulation and the 2-way interaction were not statistically significant in this analysis (p > .5 and p > .3 respectively). The attribute-based search frequencies varied significantly as a function of both the brand-attribute value (p <.001) and the range manipulation (p = .001). However, there was no significant interaction (p > .5). The specific patterns of the means relevant to tests of the search hypotheses were analyzed next.

Hypothesis H4 suggested that attribute-based search is more likely when no range information is available relative to when range information is available. As shown in Table 6-4, the mean levels of attribute-based search were 36%, 38% and 54% in the wide range, narrow range and no-range conditions respectively. A single degree of freedom contrast of the no-range condition frequency against the pooled frequencies in the wide and narrow range conditions was strongly significant (Chi-square = 12.69, df = 1, p < .0004). This strongly supports Hypothesis H4.

Hypothesis H5 predicted that when range knowledge was available, brand-based search is more likely for favorable brand-attribute values relative to those located in the middle and unfavorable portions of the range. When range knowledge was not available, the level of brand-based search was expected to remain invariant over brand-attribute values. Thus, Hypothesis H5 predicts a significant range by brand-attribute value interaction that was not observed in the aggregate analysis.

However, a closer examination showed that the lack of significance stemmed from the similarities in the brand-based search frequencies for the two known range conditions. Thus, a strict test of the hypothesis

Table 6-4
Frequencies of Search Patterns

BAV		Wide Range			Narrow Range			No Range Info			Total		
		BB	AA	OTHER	BB	AA	OTHER	BB	AA	OTHER	BB	AA	OTHER
25	#	1	13(a)	6	3	8	9	2	13	5	6	34(b)	20
	%	5	65	30	15	40	45	10	65	25	10	57	33
30	#	2	10	8	1	12	7	4	12	4	7	34	19
	%	10	50	40	5	60	35	20	60	20	12	57	31
35	#	7	7	6	4	8	8	7	8	5	18	23	19
	%	35	35	30	20	40	40	35	40	25	30	38	32
40	#	5	9	6	6	9	5	5	13	2	16	31	13
	%	25	45	30	30	45	25	25	65	10	27	52	21
45	#	8	7	5	9	6	5	5	11	4	22	24	14
	%	40	35	25	45	30	25	25	55	20	37	40	23
50	#	9	2	9	10	7	3	3	9	8	22	18	20
	%	45	10	45	50	35	15	15	45	40	37	30	33
55	#	11	2	7	9	3	8	5	9	6	25	14	21
	%	55	10	35	45	15	40	25	45	30	42	23	35
TOT.	#	43	50(c)	47	42	53	45	31	75	34	116	178(d)	126
	%	31	36	33	30	38	32	22	54	24	28	42	30

NOTES:

BB is pure brandwise search, AA is pure attributewise search.
The entries are to be read as follows:

(a) Attributewise search occured for 13 subjects, being 65% of the cell size of 20.

(b) Attributewise search occured for 34 subjects for brand-attribute value = 25, being 57% of the 60 subjects summed across Range levels.

(c) Attributewise search occured for 50 subjects for Range = Wide, being 36% of the 140 subjects summed across brand-attribute value levels.

(d) Attributewise search occured for 178 subjects, being 42% of the 420 subjects summing across all cells.

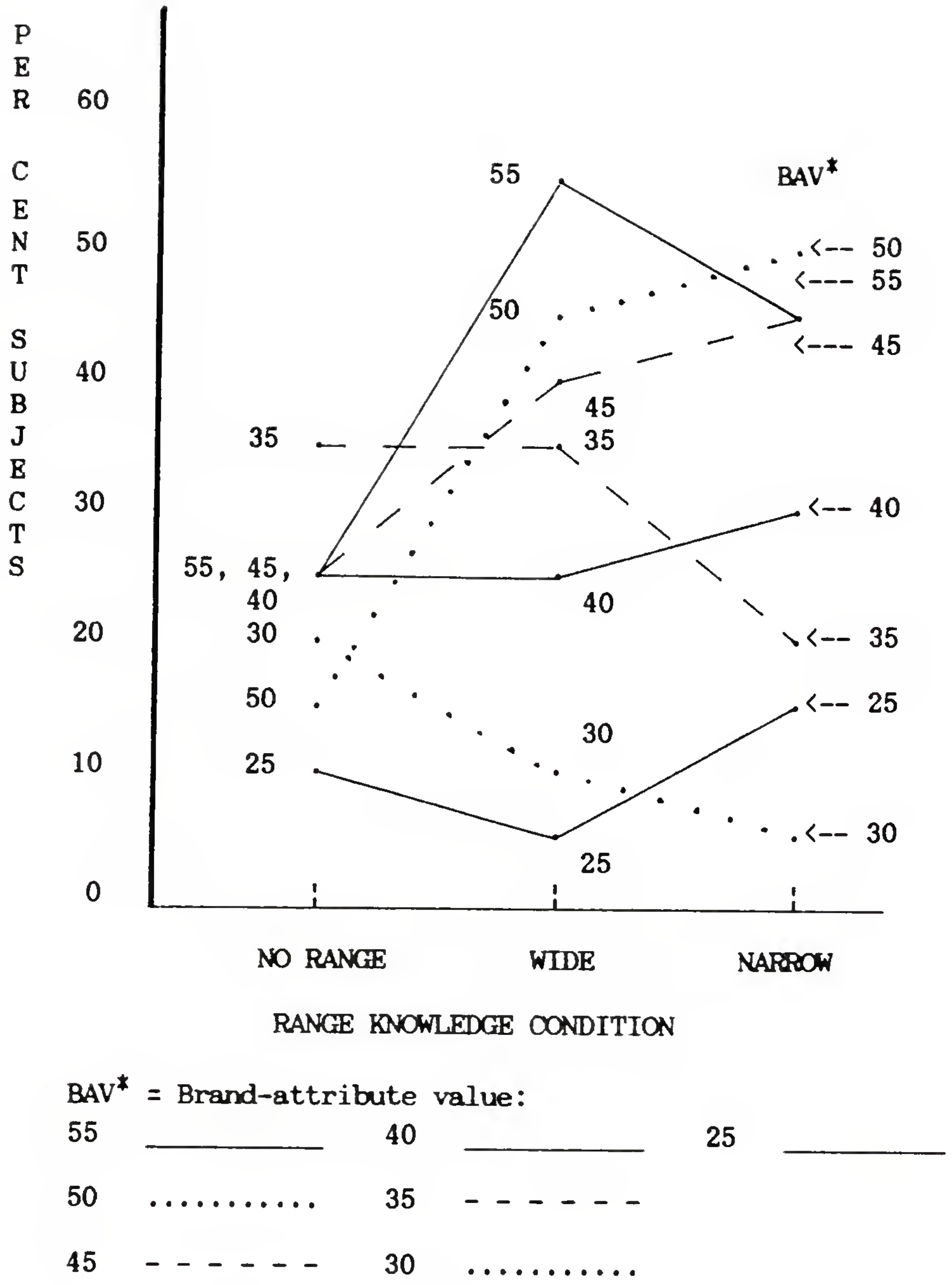


Figure 6-2
Frequencies of Pure Brand Based Search
By Study Condition

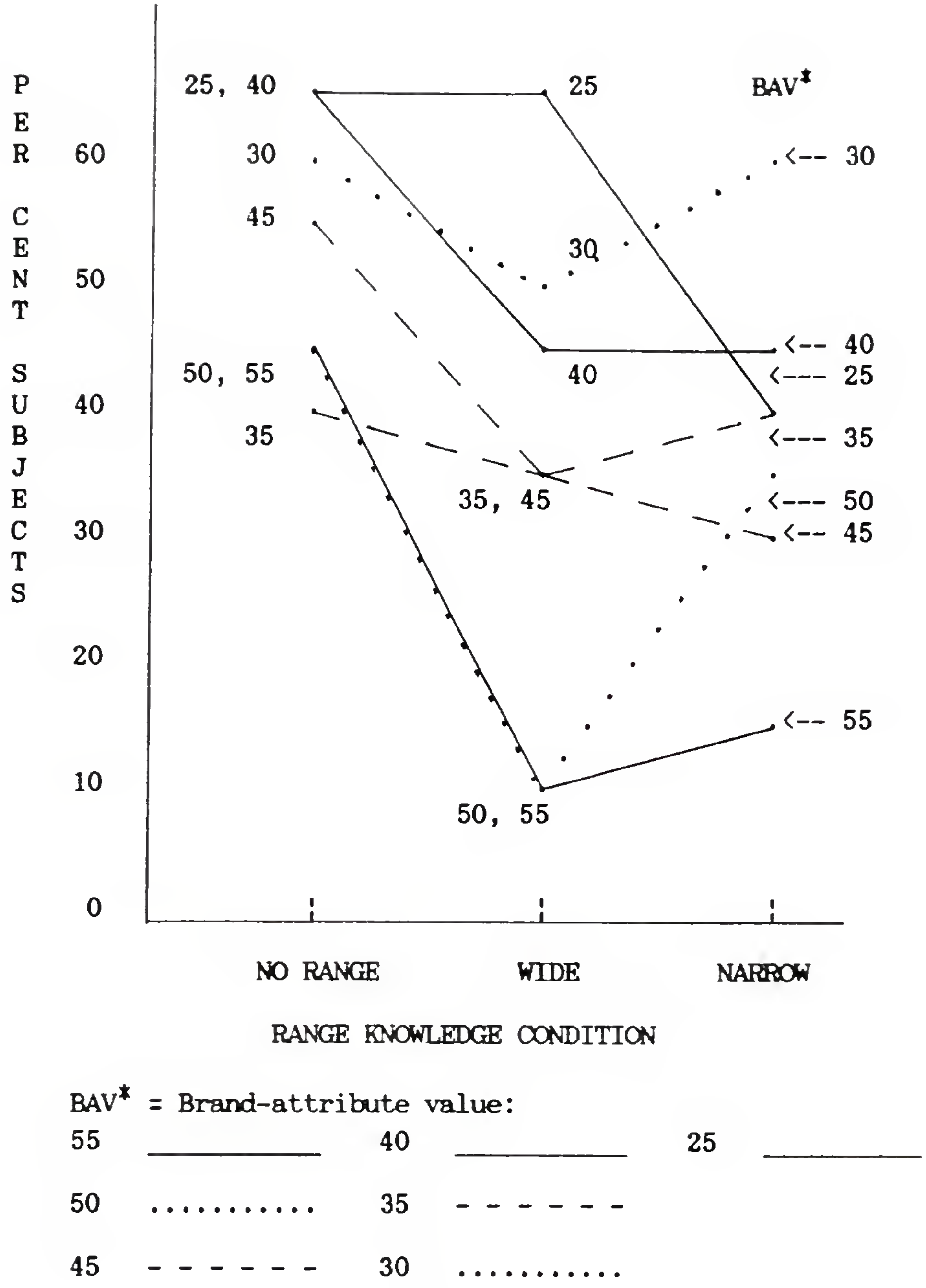


Figure 6-3
Frequencies of Pure Attribute Based Search
By Study Condition

Table 6-5
Log-linear Analysis of Search Frequencies

A. Dependent Variable: Brand-based Search

ANOVA

Source	df	Chi Square	p > F
BAV*	6	22.51	.001
Range	2	1.05	.5923
BAV x Range	12	12.97	.3714

B. Dependent Variable: Attribute-based Search

ANOVA

Source	df	Chi Square	p > F
BAV	6	25.62	.0003
Range	2	12.88	.0016
BAV x Range	12	11.19	.5130

BAV* = Brand-attribute value

involved pooling the wide and the narrow range conditions and comparing this pooled frequency of brand-based search to those observed in the no-range conditions.

The pooled analysis revealed the pattern graphed in Figure 6-4. When range was known, the brand-based search frequencies observed for the lens quality index scores of 45, 50 and 55 were significantly higher than those for lens quality index scores of 40 and below. (Chi-square = 26.18, $p < .0001$). The former pooled mean was also significantly higher than the pooled mean of brand-based search frequencies observed for lens quality index scores of 45, 50 and 55 in the no range knowledge condition. (Chi-square = 10.14, $p = .001$). Taken together, this extended analysis shows support for Hypothesis H5.

Hypotheses H6a and H6b made predictions concerning the levels of brand-based search as a function of range width and the location of the seed brand-attribute value. H6a predicted that brand-based search would be equally likely for brand-attribute values located at the upper extreme of either the wide or the narrow range knowledge conditions. As shown in Table 6-4, the frequencies of brand-based search were 55% and 50% respectively for the two extremal brand-attribute value locations (lens quality index scores of 55 and 50 respectively). Consistent with Hypothesis H6a, these brand-based search frequencies were not significantly different from each other ($z = 0.32$; $p > 0.7$). However, it should be noted that this amounts to support for the null hypothesis.

Hypothesis 6b predicted greater brand-based search for brand-attribute values located in the favorable but interior portion of

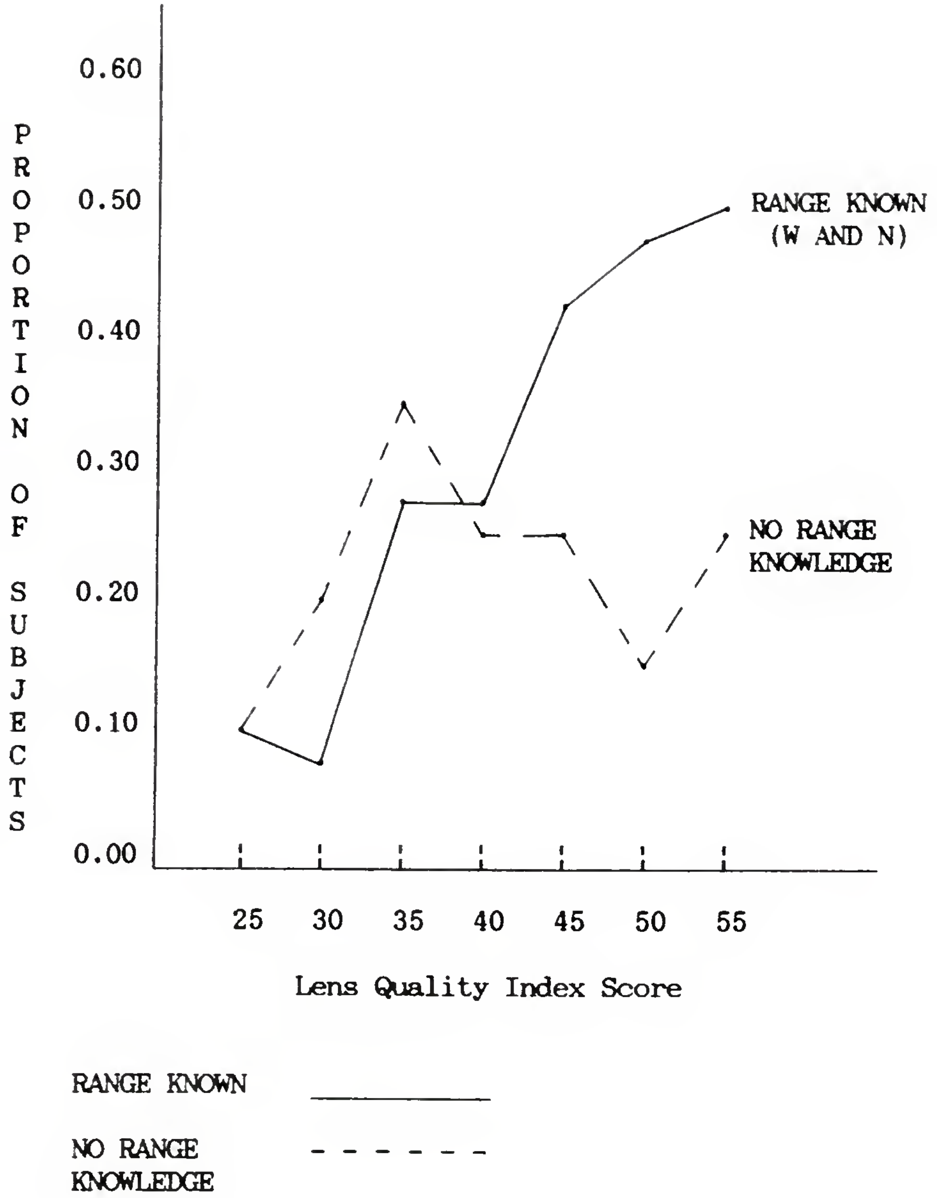


Figure 6-4
Brand-based Search Frequencies by
Range Knowledge

the narrow range relative to the wide range. Operationally, the only direct comparison that can be made is for the lens quality index value of 45. The brand-based search frequencies for this condition were 40% and 45% in the wide and narrow range conditions respectively. While these frequencies were in the predicted direction, they were not significantly different from each other ($z = 0.32$; $p > 0.7$). Thus, Hypothesis H6b was not supported.

Before proceeding to Hypothesis 6c, it is useful to relate these findings on brand-based search frequencies to those for the evaluation hypotheses tested earlier.

It will be recalled that our test of Hypothesis H3a showed evaluations were the same in the wide and narrow range conditions for brand-attribute values located at extremes. Also, while Hypothesis 3b predicted that evaluations would be more extreme for interior brand-attribute values evaluated in a narrow range, as opposed to a wide range, this was not supported by the data. Since our search hypotheses are predicated upon a mechanism that is driven by the provisional evaluations, the null findings for the search hypotheses 6a and 6b are consistent with those for the evaluation hypothesis 3a and 3b. In a sense, this is an indirect validation of our proposed mechanism.

Hypothesis 6c predicted higher levels of attribute search in the narrow range condition relative to the wide range condition for brand-attribute values located in the middle and lower portion of the known range. Operationally, this hypothesis may be tested by comparing the levels of attribute search observed in the narrow and wide range conditions for the lens quality index scores of 40, 35 and 30.

Attribute-based search levels were identical (45%) for the wide and narrow range conditions in the case where lens quality index was 40. When lens quality index was 35, a slightly higher proportion (40%) of the subjects in the narrow range condition performed attribute-based search as opposed to only 35% in the wide range condition. However, this difference was not statistically significant ($z = 0.33$, $p > 0.7$). Finally, for lens quality index = 30, 60% of the narrow range subjects did attribute search as compared to 50% in the wide range condition. This difference was not statistically significant ($z = 0.64$, $p > 0.5$). Taken together, these results show partial support for Hypothesis H6c. However, it should be kept in mind that the contrast was strongest when lens quality index = 30, which happened to be the extreme low point of the narrow range.

In summary, the analysis of search frequencies shows a consistent pattern of results. More attribute based search occurs when no range information is available. Brand-based search occurs with greater frequency when range knowledge is available and the seed brand-attribute value is favorably located on the range. In contrast, when no range information is available, brand-based search levels are not significantly affected by the location of the brand-attribute value. Finally, when range is known, brand-based search levels were similar for extremal values, and attribute search was somewhat more prevalent for less favorable brand-attribute values when one compared search patterns for the wide and narrow range. Predictions regarding increased brand based search for favorably located brand-attribute values in the narrow range condition were however not supported.

Taken together with the evaluation findings reported earlier, these results show a pattern that is strongly consistent with the provisional evaluation mechanism that was postulated in the conceptual portion of this dissertation and in an earlier paper by Assar and Chakravarti (1984). We now turn to the results concerning the confidence judgments associated with the evaluations provided by the subjects.

Tests of the Confidence Hypotheses

The confidence measures associated with the evaluation of the profiled brand were submitted to an analysis of variance as a function of the 3-level range knowledge factor, the 7-level brand-attribute value factor and their 2-way interaction. Table 6-6 presents the results of this analysis. Statistically significant effects were found only for the range factor ($F(2,399) = 66.22$, $p < .0001$). The mean confidence ratings are shown by condition in Table 6-6 and are plotted in Figure 6-5. The specific hypotheses regarding these confidence ratings were tested using planned comparisons.

Hypothesis 7a stated that relative to when range knowledge is not available, greater confidence will be held in evaluation when range information is available. In order to test this hypothesis, the mean confidence for the no-range condition (4.88) was contrasted with the confidence ratings for the wide and narrow range conditions (7.19 and 7.04 respectively). The tests of pairwise differences between means (Table 6-7) shows that in the absence of range information, subjects were significantly less confident than when range information was

Table 6-6
Mean Ratings of Confidence

Brand Attribute Value (Lens Quality)	Wide Range	Narrow Range	No Range Info	Mean
55	7.40	7.40	5.45	6.75
50	7.50	7.50	4.60	6.53
45	7.25	7.15	4.35	6.25
40	7.25	6.80	5.20	6.72
35	6.95	6.75	5.15	6.28
30	6.95	6.80	4.25	6.00
25	7.00	6.90	5.15	6.35
Mean	7.19	7.04	4.88	6.37

ANOVA

Source	Sum of Squares	df	F	p > F
BAV*	19.95	6	0.94	.4654
Range	467.95	2	66.22	.0001
BAV x Range	24.05	12	0.57	.8684
Error	1409.85	399		

BAV* = Brand-attribute value

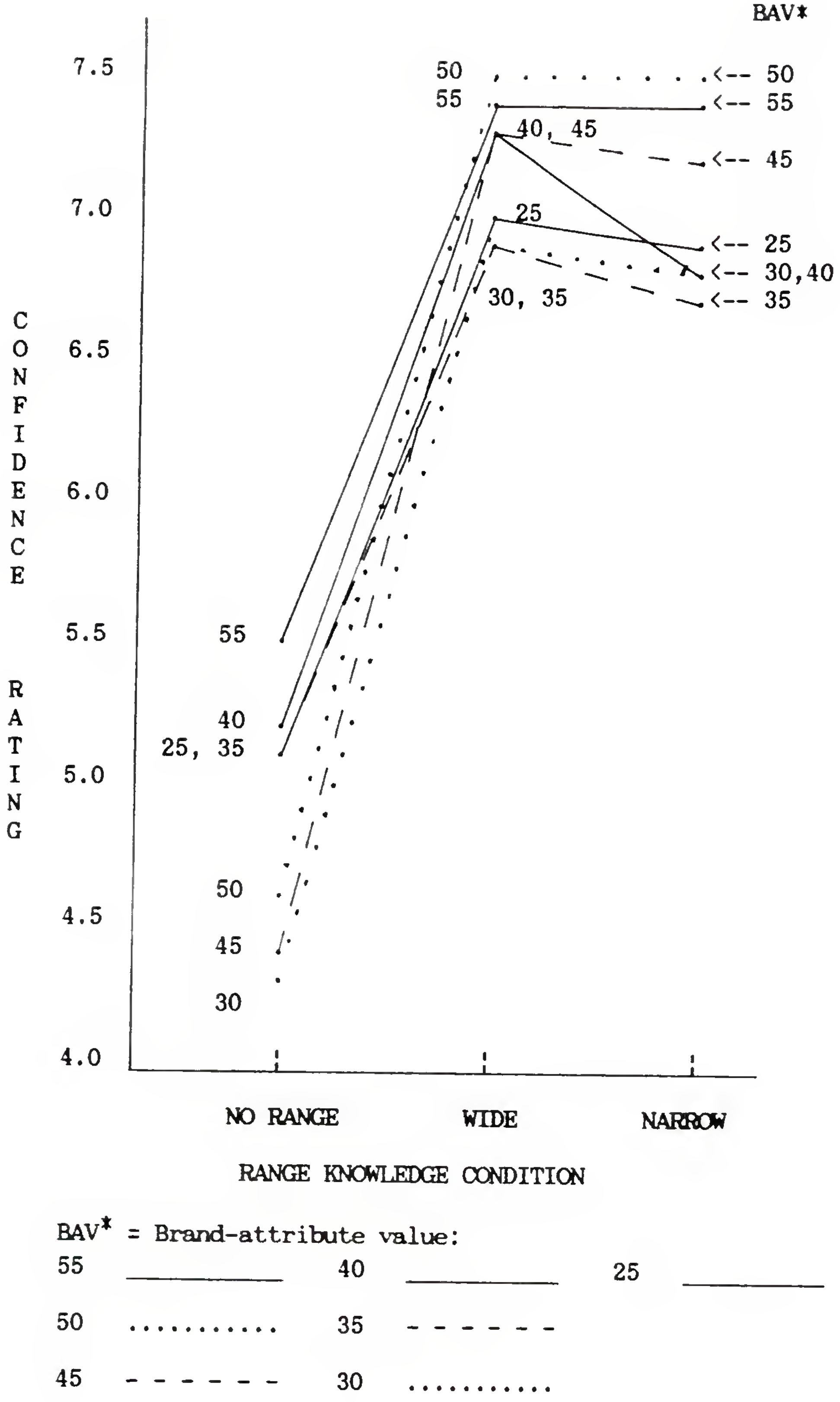


Figure 6-5
Confidence Ratings by Study Condition

Table 6-7
Simple Contrasts of Confidence Ratings

Pairwise Differences in Means

	Wide Range	Narrow Range	No Range
Wide Range	-		
Narrow Range	0.15	-	
No Range	2.31	2.16	-

p < .05 Experimentwise

Minimum Pairwise Significant
Difference (Tukey) = 0.53

available. This provides support for H7a. The same test also shows that the confidence ratings were not different between wide and narrow range conditions. This supports Hypothesis H7b which predicted that the width of the known range of attribute values would not affect confidence judgments.

These results are consistent with our previously stated premise that the absence of range knowledge leads to uncertainty in evaluations. This uncertainty is reflected in subjects' lower confidence in their evaluations. In contrast, when range knowledge is available, it provides a context for the evaluations, thus reducing uncertainty. These findings suggest that confidence is affected mainly by the presence or absence of range knowledge, rather than by the width of the known range of attribute values.

Hypothesis H8 showed that greater confidence will be associated with evaluations of given brand attribute values at the extremes of the known range, compared to values inside the range. For the wide range, this hypothesis was tested by comparing the pooled mean confidence ratings for extreme lens quality index scores of 25 and 55 (mean = 7.20) against the pooled confidence rating for the interior values of 30, 35, 40, 45 and 50 (mean = 7.18). This difference was not significant ($F = 0$; $p > 0.5$). For the narrow range, the pooled mean for the extreme lens quality index scores of 30 and 50 was 7.15. The pooled mean for the interior values was 6.90. These two means were also not significantly different from each other ($F = 0.42$; $p > 0.5$). Thus, Hypothesis H8 was not supported. Hence, consistent with the previous findings, it seems that the extremal location of the brand-attribute value does not enhance confidence in evaluations over and beyond what is gained when range knowledge is available.

Tests of Hypotheses Regarding Expected Range Violations

We have previously discussed the possibility of cases where the consumer encounters a brand-attribute value that violates the known range of attribute values. When examining the likely impact on evaluations, it may be that the consumer merely ignores the violation and updates the range, treating the new value as the updated extreme of the range. Alternatively, the range violation may create questions about the credibility of the range information. Then, as stated in Hypothesis H9a, the brand-attribute value that was higher than the previously known range may receive a lower desirability rating than it would, if it were the upper extreme of a known range of attribute values.

This hypothesis was tested by comparing the mean rating (7.45) given to the profile with a lens quality index of 55 by subjects in the narrow range condition to the mean rating (7.30) that this profile received in the wide range condition. A comparison was also made to the mean rating (7.30) received by the profile with a lens quality index of 50 in the narrow range. These values were not significantly different ($p > 0.7$). Thus Hypothesis H9a was not supported. In fact, the data were in the opposite direction from the prediction of this hypothesis.

Hypothesis H9b stated that a brand-attribute value that is lower than a previously known range will receive a higher rating than it would if it were at the lower extreme of a known range of attribute values. A comparison of the mean rating (4.30) given in the narrow range condition to the brand profile with a lens quality index of 25 to the mean rating (5.25) given to the same profile in the wide range condition shows effects that are in a direction opposite to that predicted ($p < 0.05$). A comparison with the mean rating (4.95) given to the profile with a lens quality index of 30 in the narrow range condition also shows results that are the reverse of those predicted ($p > 0.1$).

Thus Hypothesis H9b was not supported by the data. In fact, the results seemed to be consistent with a range updating explanation since the profiles with attribute values that violated expectations received slightly more extreme ratings than profiles with attribute values located at the stated extreme of the known range.

Hypothesis H10 stated that the confidence associated with the rating of a profile with an attribute value that violates a known range will be lower than if the brand-attribute value did not violate the range. Operationally, it was found the brand profile with the lens quality index of 55 received the same confidence rating (7.4) in the wide range where it was at the stated upper extreme of the range as it did in the narrow range where it violated the range expectation. Similarly, the profile with a lens quality index of 25 received a confidence rating of 6.90 in the narrow range condition and 7.00 in the wide range condition. This difference was not statistically significant ($p > 0.85$). Thus, Hypothesis H10 was not supported by these data.

Finally, Hypothesis H11 predicted that when consumers encounter a brand-attribute value that violates the previously known range of values on an attribute (at either end), there would be a greater likelihood of attribute based search relative to if this brand-attribute value did not violate range expectations. In other words, this hypothesis is based upon the premise that lowered confidence due to the violation of range expectations will cause the consumer to look for the attribute scores of additional brands as a basis for comparison. Operationally, the condition in which lens quality index was 55 had only 10% of the subjects search by attribute in the wide range condition. By contrast, 15% of the subjects searched by attribute in the narrow range condition where this lens quality index of 55 violated the range expectation. However, this difference is not statistically significant ($p > 0.6$). When the lens quality index was set at 25, attribute search in the narrow range condition (40%) was actually lower than in the wide range condition (65%). This difference, which is in the opposite direction from that predicted by Hypothesis 11, was not statistically significant ($p > 0.1$).

Thus, no support was found in these data for Hypothesis H11. Taken together, the findings for evaluation, confidence and search seem to indicate that violations of the prior range expectations had little effect. Evaluations were made as though the brand-attribute value that violated expectations had been used to update the previously-provided range knowledge. Confidence ratings were similarly unaffected. Consistent with these results, systematic effects were also not observed on search patterns.

Summary and Discussion

The preceding findings substantiate the contention that knowledge of the range of attribute values in a product category affects how consumers evaluate and search for product related information. Before proceeding to a discussion of the findings we will highlight some caveats that should temper the interpretation of the results.

Study Limitations

First, the provisional evaluation mechanism proposed here was developed from a premise that the attribute(s) concerned were relatively difficult to comprehend. Many attributes are relatively easy to understand and, consistent with our general conceptual framework, other types of product class knowledge may guide evaluations and choice behavior. Second, the mechanism is most effective when information is searched sequentially in making a brand choice. In instances where all or most of the choice relevant information is directly available, more complete acquisition of information is likely. However, even in such instances, range knowledge may affect the evaluation of individual pieces of information. Since the present study was situationally configured for these circumstances (SLR cameras were an unfamiliar product, and the lens quality index attribute was difficult to comprehend), the findings must be generalized with caution.

Finally it should be pointed out that the sequential search analysis was conducted without taking into account how the specific brand-attribute value searched would impact upon contingent search patterns. While this is, in some ways, the essential point revealed by the study findings, it is important not to lose sight of a variety of other contingencies besides provisional evaluations that may also guide search (e.g., see Brucks 1985; Biehal and Chakravarti 1986).

Implications of the Findings

Taken as a whole, the study findings provide strong support to the theoretical contention that a disaggregate approach to studying consumer knowledge and its effects in judgment and choice can be implemented within an empirical framework and can provide many significant advantages over an aggregate approach. By recognizing that consumer knowledge has multiple facets, we open the door to an enumeration of different types of knowledge and thereby to more probing examinations of their sometimes reinforcing, sometimes conflicting roles in consumer judgment and choice. In fact, the next two chapters of this study will lay the groundwork for an investigation of the effects of inter-attribute correlational knowledge on search, evaluation and choice.

Returning to the substantive findings of this study, perhaps the single most important aspect of the results was the difference that range knowledge made to consumers' evaluation and search processes and also to their confidence judgments. In the absence of range information, subjects avoided extreme evaluations and also were significantly less confident in their judgments. These results show that range knowledge helps in the evaluation of newly encountered brand-attribute values literally by providing a mental yardstick that serves as the context of the judgment.

There are two aspects that need to be considered at this point. First, for the desirability ratings, the pattern of variances was as shown in Table 6-8. The within-cell variances were lower when range is known, and the brand-attribute values on lens quality are high (i.e.,

Table 6-8
Variances of Desirability Ratings by Condition

Brand Attribute Value (Lens Quality)	No Range Information	Wide Range	Narrow Range
55	2.134	0.957	0.892
50	3.292	0.660	0.536
45	2.260	0.765	0.892
40	1.565	1.063	1.713
35	2.828	0.800	1.957
30	2.568	1.607	1.839
25	2.786	2.407	3.905

45, 50 and 55). In the no-range condition, the variances are considerably higher. This may reflect the uncertainty of subjects who lack a context for the judgement. But it is possible that such uncertainty in psychological terms may lead to more randomness on the part of those lacking range knowledge. This in turn may lead to more random error, and consequently to the higher observed variances when range is not known.

Second, an alternative mechanism may result in the pattern of desirability ratings observed in the no-range case. In the absence of range knowledge, subjects may implicitly assume that the available range of values is very wide or somehow in a "default" range of, say, 1-100. In such a case, the desirability ratings of favorable and unfavorable brand-attribute values may tend towards the center of the response scale simply because the values were assumed to be "mid-range." The generation of such natural "default" ranges as judgement contexts is an interesting issue that needs to be addressed in future research.

In addition to the role that it plays in evaluation and in fact, perhaps as a consequence of it, the availability of range knowledge impacts on search behavior. In a sequential search situation, attribute-based search is more common when range is not known. When range information is available, brand-based search is more frequent when consumers encounter favorably located brand-attribute values. The pattern of search effects was quite consistent with the pattern of effects detected for evaluations and confidence judgments. This strengthens the assertion that the provisional evaluation and the confidence with which they are held mediate search behavior. These important effects of range knowledge (a contextual variable) on search (a behavioral criterion) provide evidence in favor of these effects on evaluations being considered as true changes in subjective representations of the stimuli rather than merely as response language differences (see Wyer 1974, Chakravarti and Lynch 1983).

However, the findings also showed that the bulk of the effect of range knowledge lies in its presence/absence. At least within the manipulations used in this study, the findings suggest that varying the width of the range had little impact on evaluations, confidence or search. Thus, there seems to be some degree of evaluative and behavioral stability across simple variations in range knowledge contexts.

There are several implications of these findings that relate to marketing mix effects. First, the evaluative findings suggest that in technologically complex or unfamiliar categories, range knowledge can play a key role in the evaluation of the product. Thus, by providing information regarding the available range of brand-attribute values in a message, or by making comparisons to other brands, marketers may be able to help consumers evaluate their own brands and in some circumstances actually influence the subjective evaluation of the brands. Thus, range information embedded in an advertising message can be a powerful tool for supporting consumer decision making and also for influencing evaluations in a competitively desirable way.

On the flip side of this coin, manipulative use or non-use of range information can cause consumers to be misled in their evaluative judgments. The study showed that when dealing with unfamiliar products, naive consumers may avoid assigning unfavorable evaluations when they lack range knowledge. Thus inferior products may be difficult to weed out comparatively if the consumer information environment is not rich in such comparative information. Further, in some cases range information can be used to obtain a contextually favorable evaluation of an intrinsically undesirable product or product feature.

To illustrate this, consider an attribute such as the tar content of a cigarette. If the cigarette smoker has no basis to judge what a "safe" level of tar is, even high levels of tar content may not be judged unfavorably, particularly if other cigarette attributes are strongly promoted. Moreover a "cunning" marketer can also use range information on tar content to have a product receive a favorable evaluation by comparison with other higher tar content cigarettes. However this favorable contextual evaluation may be held without it even being salient that no matter how low the level of tar content, it is injurious to health. Clearly, such possibilities leave regulatory bodies with much food for thought in the area of consumer protection.

Second, the findings on search behavior as a function of range knowledge clearly outline the potential for using range knowledge and brand-attribute value information in a promotional message as a way to foster further examination of a target brand. Thus, the findings suggest that if a brand that performs well on a particular attribute fails to crystallize this evaluation by providing range information, it may cede its competitive advantage as the consumer may search other brands on other attributes where the comparisons may not be as favorable. This is particularly important since it is fairly well known that the level of search in technically complex products is fairly low (see Newman and Staelin 1973, Wilkie and Dickson 1985) and that the initial targets of information search may significantly influence choice.

Third, the findings pertaining to the cases where the encountered brand-attribute value violated a known range of attribute values suggest that the prior knowledge was merely updated without any effects on its credibility. These findings suggest that consumers are able to assimilate at least marginal improvements on the attribute levels of new or extended products without any resultant discontinuities in perception. Taken together with the lack of significant variation in the criterion measures as a function of changes in range width, these findings are consistent with assertions regarding the stability of evaluative processes over contextual changes of a contextual nature. The extent to which this stability continues to be observed over extended variations is an empirical question. The answers may provide managers with some pragmatic understanding of the magnitudes of contextual variations that are necessary to produce meaningful levels of impact on behavioral criteria related to evaluations.

Perhaps one of the most intriguing application areas of range knowledge research is in the context of reference pricing. Managers continually attempt to influence the evaluation of a stated price for their product by comparing it to a range of available prices or to a specific price level that is "set up" as a reference price. It is interesting to examine whether providing a reference price can affect evaluations even when the consumer has a good understanding of the price scale that is anchored in price range knowledge. These and a variety of related questions regarding the stability of evaluations and behavior as a functions of range knowledge remain to be addressed by future research.

We turn now from our examination of the role of attribute range knowledge as one type of consumer knowledge in a product class. The next two chapters provide a framework for studying the role of yet another element in our consumer knowledge taxonomy--knowledge of inter-attribute correlations in a product class.

CHAPTER 7

KNOWLEDGE OF INTER-ATTRIBUTE CORRELATIONS IN A PRODUCT CATEGORY: EFFECTS ON SEARCH AND EVALUATION

The preceding chapter examined the role of attribute range knowledge in consumer evaluation and search and also explored its secondary effects on variables such as confidence. In this chapter, we turn to the next element in our product class knowledge taxonomy, knowledge of inter-attribute correlations, and discuss its likely role in consumer decision making.

At an intuitive level, the acquisition of correlational knowledge and its use is easy to describe. Thus, we learn through experience that discount stores price their products reasonably but offer a limited range, that fancy packaging denotes higher prices and that expensive restaurants offer good service. In some other cases, these associations are established through the media. For example, an automobile advertisement that establishes the credibility of an acceleration claim by referring to a larger engine size may alert a previously technically naive consumer about the relationship between the engine size and acceleration. Similarly, information about a relationship between engine size and fuel-efficiency may be gathered from word of mouth or through direct information search, either by examining cars at various dealerships or by reading articles about the relationship between engine size and fuel-efficiency in Consumer Reports.

Recently, both psychologists and consumer researchers (e.g. Alloy and Tabachnik 1984, Bettman, John and Scott 1986) have formally examined issues in covariation assessment and have reported mixed findings regarding the accuracy of consumers' covariation assessment. In contrast to this work which focuses on the learning of relationships in the environment, our research in this dissertation examines how such correlational knowledge is used in consumer decision making. In other words, we examine not how consumers assess correlation but rather on how such knowledge (whether or not objectively accurate) affects consumer search and evaluation of products in choice.

This chapter sets up the conceptual framework for an empirical study of the effects of correlational knowledge that is described in the next chapter. We will begin by reviewing past research on the use of correlation in consumer decision making, sequentially reviewing (1) research on the price-quality relationship, (2) the general use of correlational knowledge to develop inferences in consumer judgment situations and (3) research on the use of correlational knowledge to guide information serach. Based on this review, we will develop a proposed mechanism by which correlational knowledge may be used by a consumer to search more efficiently in a product class. The likely impact of such correlational knowledge-driven search strategies on evaluations and choices will be discussed. Moreover, the discussion will also identify some relevant background factors that might accentuate or attenuate these postulated effects of correlational knowledge.

The Price-Quality Relationship

The old caveat "you get what you pay for" is, in essence, a type of inter-attribute correlation that as consumers and as researchers we have come to call "the price-quality relationship." The research in this area comes from several source disciplines as well as from the traditional marketing and consumer research literatures. Broadly categorized, one part of this literature has examined how consumers perceive or view the likely relationship between price and quality, whereas the other category of research has examined the ecological or objective occurence of a price-quality relationship for different products. We will review these literatures sequentially to obtain a sense for how consumers use this rather pervasive type of inter-attribute correlational knowledge.

Consumer Perceptions of the Price-Quality Relationship

Do consumers generally believe that "you get what you pay for?" Although many researchers have examined the issue and looked at the available empirical evidence, the findings are somewhat equivocal. The bulk of the research suggests that people do indeed believe in the existence of a general relationship between price and quality for most product categories. However, methodological problems have qualified the findings and the behavioral effects of such correlational knowledge have been difficult to trace.

Olson (1977) and Monroe and Petroshius (1981) have reviewed a number of studies that generally support the expectation that consumers perceive higher priced products to be of higher quality. However, in some of the earlier studies, (e.g. McConnell 1967), the focal variable, price, was the only differentially available piece of information. This left room for criticism that when price is clearly the focal piece of information, subjects will naturally tend to associate price differences with perceptions of quality. This is essentially a demand effects criticism and makes the point that studies in this area should be conducted in environments where a more complete representation is possible of the variables that influence price-quality judgments.

In order to circumvent this criticism, more recent studies have been of the multiple-cue variety. In these studies, other relevant cues such as brand name, store image and prior product knowledge were also provided along with price information. Unfortunately, however, these studies which were done in more complex and realistic environments did not yield conclusive evidence. Thus, a few of these studies have provided evidence of a positive price-quality relationship. In a study of consumers' quality perceptions of carpets, Wheatley and Chiu (1977) found that price and store image were positively related to quality ratings. However, even while the authors focused on these interpretable effects about the role of price as a quality cue, there were a number of statistically significant interaction terms that were difficult to interpret within a coherent and simple theory of the perceptual relationship between price and quality. For example, one significant interaction involved the subjects' education, the price and the color of carpet. These results suggest that the perceived price-quality relationship may be moderated by a number of other variables.

Several studies have shown that price is used as a cue to choice when there is uncertainty about the quality of the products. Leavitt

(1954) found that in two heterogeneous product classes (razor blades and floor wax), subjects preferred the higher priced brand. However, when quality was perceived to be the same (for cooking sherry and moth flakes), they did not buy the higher priced product. Lambert (1970) found similar results, whereby a greater proportion of subjects selected the high-priced brand when they perceived greater product quality variations. These studies show that the use of a perceived price-quality relationship in choices is moderated by the level of uncertainty in the quality judgments. The findings probably generalize to situations when subjects have knowledge of quality differences. Obermiller and Wheatley (1985) found that when people were led to believe that product alternatives differed in features or quality, they exhibited a preference for the higher-priced brand. Although search was not tracked in these studies, one may speculate that the choice of a higher priced brand may have been a way of saving on the effort of searching for brand information items and evaluating them.

While the above studies noted a perceived price-quality relationship (even if moderated by a number of variables such as uncertainty), some other studies found that even when a price-quality association was known, price simply was not used as a cue to quality. For example, Rao (1971) found that greater prior knowledge about brands of razor blades was associated with higher quality perceptions. The availability of a consumer test report tended to increase the salience of the quality dimension. However, price variations produced no effects on individuals' quality perceptions.

In another study, Monroe (1976) manipulated price level while controlling for subjects "cognitive level" (previous experience with a brand). He found that housewives' cognitive level played a large role in influencing preference decisions. Price was used less as a cue in these decisions. Moreover, Monroe found that when a consumer's "cognitive level" was different for two brands, a larger price difference was needed to shift brand preference, compared to the case when cognitive levels were identical. Thus, knowledge (experience) moderated how prices affected choice.

Even though they represent a major advance over the single-cue studies reported earlier, some of the multiple-cue studies also have been criticised for the possibility of demand artifacts. In some studies (e.g. Leavitt 1954, McConnell 1967), the subjects were highly educated and may have deduced the real purpose of the experiments. In fact, a study by Valenzi and Andrews (1971) hypothesized that quality ratings would be positively related to price information given, and to actual differences in the products. They configured the study such that quality ratings were positively related to price information given, but actual product differences accounted for a larger proportion of the variance in quality ratings. Subjects tasted samples of butter and margarine, and rated them on a quality scale. Even though subjects were told the study was examining sensory taste perception, 46 percent guessed that the true purpose was to examine the relationship between price and quality.

In summary, the studies reviewed above show that under some circumstances, consumers may use the correlation of price and quality in order to infer product quality. However, the evidence shows that this tendency may not be pervasive and occurs under conditions of uncertainty or expected variability in quality. Moreover, the literature also suggests the need to be circumspect when designing a study so that obvious sources of demand artifacts are eliminated.

Objective Evidence Regarding the Price-Quality Relationship

While folklore would have us believe that "you get what you pay for," it is an interesting empirical question as to whether price and quality of products are indeed empirically related. This question becomes relevant in the light of evidence that perceptions of such relationships are rather mixed and apparently influenced by other variables.

Sproles (1977) reviewed findings from studies of objective (or actual) price-quality relationships for 135 product groups. In 51 percent of these cases, a positive price-quality correlation did, in fact, exist. In 35 percent of the product groups, there was no particular relationship, while for the remaining 14 percent, there was a negative relationship between prices and actual quality. While these results suggest that the environment offers mixed cues for the learning of price-quality relationships, they also point up the disconcerting possibility that in some product categories, consumers who do not search and rely upon a positive price-quality correlation, may be choosing dominated products that are inferior in quality to cheaper ones.

In a study of informational imperfections in local consumer markets of varying sizes, Maynes (1978) examined the relationship between price and quality for a number of products. Objective quality assessments made by the Consumers Union were plotted against prices for two products which were considered homogeneous (term life insurance and camera film) and one product for which quality differences were expected (cameras). The perfect (efficient) information frontier was defined on these plots as the lowest price point for the two homogeneous products, or the lowest line segments for the heterogeneous product.

The perfect information frontier for cameras was positively sloped. This showed that objective product quality was positively related to price. However, there were large dispersions for the prices quoted by retailers for the same item, for all three products. Thus, in some cases, consumers were paying a price premium for products without necessarily receiving added benefits of subjective value (e.g. style) or of convenience of location. This implicit reduction in purchasing power could be attributed to informational imperfections in the market.

In summary, not many studies have directly explored the objective facts about the price-quality relationships in the marketplace. The ones that have studied this issue have shown significant imperfections. These results suggest that it is critical that we gain greater understanding of how such knowledge or expectations may guide consumer search and evaluation.

Correlational Knowledge and Inferences

The use of price as a cue to inferences about product quality represents a type of consumer judgmental heuristic (Tversky and Kahneman 1974) that simplifies task demands. It can also serve as a basis for generating information that is either missing or inaccessible during a decision. In the more general case, such inferences may occur based on knowledge of the correlation between any two attributes of brands in a product category. Although some have argued that such correlations are difficult for consumers to assess from direct observation, nevertheless, if such knowledge is activated during a decision, it may be used to make decisions, whether or not it is objectively accurate.

While volumes have been written about inferential processes in judgment (see Wyer and Carlston 1979, Wyer 1974), the explicit role of correlational knowledge in multi-attribute judgment escaped consideration until quite recently. Commenting on research related to the adding versus averaging controversy in the information integration arena, Cohen, Miniard and Dickson (1980) argued the possibility that in forming integrated judgments, subjects may not rely solely upon the information provided by the experimenter. For two correlated judgmental dimensions, the object's value on one dimension may be inferred from knowledge of its value on another. The final judgment may thus be based on both the provided and the inferred information.

Yamagishi and Hill (1981) developed this notion formally in their path analytic integration (P.A.I.) model which allows for non-independence of items of information being integrated into a judgment. In this model, the overall judgment based on two pieces of information, X_1 and X_2, is represented as:

$$Y_2 = b_1X_1 + b_2X_2$$

When one of the items, say X_2, is missing, subjects are assumed to infer $X_2' = b_{21}X_1$, where b_{21} is a measure of the relationship between X_2, and X_1. The overall judgment is then given by a weighted sum of given information and inferred information:

$$Y_1 = b_1X_1 + b_2X_2' = b_1X_1 + b_2b_{21}X_1$$

This model has several interesting properties that help represent some rather well-known findings in the judgment literature. For example, one rather robust finding in information integration is that an overall judgment becomes more extreme as the number of information items used in the judgment increases. This occurs even if the scale values of the information items are held constant. The averaging model of information integration explains this set size effect by assuming that an initial impression X_0 is included with the information items presented. Thus, the overall judgment based on n items is given by:

$$Y_n = \frac{(w_0X_0 + w_iX_i)}{(w_0 + W_n)}$$

Here X_i is the scale value of an information item, w_i is the weight of that item and W_n is the sum of all item weights. An additional feature of this empirical set size effect is that its magnitude decreases with increases in the number of information items. In the P.A.I. model, the set size effect depends on the difference between the actual value of the new item of information, X_{n+1}, and the corresponding inferred value X'_{n+1}. Thus, the decelerating set size effect can also be accounted for by the P.A.I. model.

In a more recent paper, Yamagishi and Hill (1983) presented a reconceptualization of the P.A.I. model that they termed the Path Analytic Averaging (P.A.A.) model. Here, the overall judgment Y_{nm} is based on both presented and inferred items using an averaging process:

$$Y_{nm} = \frac{\sum_{i=1}^{n} w_i X_i + \sum_{i=n+1}^{m} w_i X_i'}{W_n + \sum_{i=n+1}^{m} w_i}$$

Yamagishi and Hill (1983) contrasted judgmental processes involving inferences using this model. To illustrate how the model works, consider the case where n items of information are presented and m are considered important. For any m, and $n < m$, all the necessary information is not known. Since important information is missing, it may be inferred. In this case the P.A.A. model predicts the set size effect. On the other hand, in the case where $n = m$ to begin with, and an additional item is presented and deemed important, no important information is missing, and inferences are not needed. Here the P.A.A. model predicts no set size effect.

As the above discussion shows, inter-attribute correlations serve as the basis for inferences in both the P.A.A. and P.A.I. models. Both models developed in the Yamagishi and Hill (1981, 1983) papers represent formal attempts to analytically represent the effects on judgment of phenomena related to inferences based on inter-attribute correlational knowledge. Experimental tests of these models provide some support about the formation and use of inferential beliefs in multi-attribute judgment.

Huber and McCann (1982) provide a rather dramatic demonstration of the impact of inferential beliefs on product evaluations. Their findings showed that when quality information was missing on a set of brands, subjects used their price-quality correlational knowledge to make inferences about the missing information. These inferences were strongest when they were explicitly prompted. The subjects made overall evaluations using the inferred values. Consistent with a model of the inferential process, Huber and McCann found that product evaluations were higher when correlation-driven inferences were made relative to when such inferences were not made.

In general, therefore, empirical evidence exists in support of the use of correlational knowledge to infer missing information in a judgment context. Recent research has shown that such inferences are most likely when the inferential bases are readily accessible either externally or in memory and when these bases are diagnostic for the consumer decision task at hand (Feldman and Lynch 1987, Lynch, Marmorstein and Weigold 1987, Dick, Chakravarti and Biehal 1987). Moreover, these rather general principles also explain those situations where researchers have found no evidence of inferential activity even when it was warranted (Simmons 1986, Lynch, Marmorstein and Weigold 1987).

Correlational Knowledge and Information Search

As the preceding review shows, there has been a fair amount of research on the use of correlational knowledge to make inferences in judgment. However, relatively little empirical attention has been given to testing the notion that consumers may indeed be influenced to search for information differently when they possess knowledge of inter-attribute correlations.

In instances where consumers expect strong correlations between product attributes relevant to judgment, they may make inferences based on information on one attribute about what the value on another attribute might be. This may then influence which brands are examined during search. Thus, a consumer who believes "you get what you pay for" may not examine the actual features delivered by a product simply because it is low priced.

John, Scott and Bettman (1986) examined whether beliefs about covariation led to search patterns that were more likely to confirm rather than disconfirm these beliefs. For instance, if consumers treat a belief as a hypothesis to be tested, they may only seek information that is more likely to confirm the hypothesis, rather than disconfirm it. Thus, a consumer who believes that a positive price-quality relationship exists in a particular product category, may sample only higher priced brands, find they are of good quality and hence confirm the initial belief. Their experiments supported this biased sampling notion and points out two important issues. First, if consumers rely on their knowledge that particular attributes are correlated, this may affect which brands are examined during search. Second, in cases where the prior knowledge is inaccurate, biased sampling may lead to the gathering of information that can contribute to the persistence of objectively inaccurate perceptions of covariation.

The simple intuition that follows from this literature review is that knowledge of inter-attribute correlations (such as a price-quality relationship) may serve as the basis for inferences regarding a product's attribute value from knowledge of another attribute value. In the context of pre-decisional information search, this leaves an opportunity for simplifying a given decision task and also reducing the amount of search effort involved. Given the prevailing notion of a consumer who behaves as a cognitive miser (see Bettman 1979, Olshavsky and Granbois 1979, Biehal and Chakravarti 1986), this suggests that inter-attribute correlation knowledge may serve as the basis for a powerful tool for attaining parsimony in search. Regardless of whether the consumer can accurately assess covariation, or whether beliefs regardings covariation conform to objective reality, the consumer may still use such beliefs to draw inferences, curtail search, form product evaluations and make choices. In fact when task demands require it, and diagnostic information is available for making such inferences, consumers may actually acquire such information from the environment and make inferences consistent with such information (Dick, Chakravarti and Biehal 1987).

In the next section of this chapter, we formalize this intuitive notion into a mechanism that will form the basis for some testable propositions. We will also examine the role of some background variables that may moderate the use of inter-attribute correlational knowledge in search.

Correlational Knowledge in Consumer Decisions: A Proposed Mechanism

Consider the situation where a consumer faces the choice of a brand in a multi-brand product category. Suppose for the moment that this consumer does not possess or have easy access to information on brand-attribute values that may be input into an informed judgment. In this section, we will outline a formal mechanism by which this consumer may use inter-attribute correlational knowledge to search for information. We will then describe how these search patterns may influence evaluations and choice.

As earlier chapters in this dissertation have pointed out, there clearly are other types of knowledge regarding the product category that may guide the search, evaluation and choice process. For example, a diligent consumer, who comprehends the meaning of the attributes relevant to the product category, may search exhaustively, and examine different brands on all the relevant attributes. Alternatively, the consumer can simplify the task if he or she knows summary attribute importances. Brands may first be examined on the most important attribute and then only those which are dominant on that attribute may be examined on the other attributes. Yet another approach may be to first set up criterion levels for each attribute. These may be based on prior knowledge or usage experience and only brands that meet the criteria on all attributes may be considered. In both these examples, choice heuristics (e.g., a lexicographic and a conjunctive decision rule respectively) are used to simplify the choice task.

The use of inter-attribute correlational knowledge serves as another option for task simplification. If consumers know (or believe they know) that specific attribute pairs are correlated, they may use this implicit inferential ability to save on the effort of searching for information. Since the values on one attribute can be used as cues to the values on the other, the consumer may acquire information on only one of the pair of correlated attributes. The inferred value may be incorporated in an evaluation of the brand (Yamagishi and Hill 1981, 1983, Huber and McCann 1982). It is fairly obvious,then, that such evaluations may influence choice.

In order to develop the process more formally, we will distinguish between three situations that pertain to what is known about the correlation between two attributes in a product category.

We first consider the baseline situation when the consumer knows that there is no correlation between two target attributes. Here, the consumer is likely to acquire the attribute values on both the attributes if an informed evaluation is to be made. The evaluation is likely to be based on those values. Consequently, the chosen brand is likely to be one that is evaluated favorably based on the actual attribute values and the specific decision rule or choice heuristic used.

The next situation we consider is one where the consumer is uncertain about the presence or absence of a relationship between two attributes. The search outcome in this case may be similar to the case when no correlation is expected. The consumer may search exhaustively or rely on other heuristics, using other types of knowledge that may be relevant in ways suggested previously.

However, in these instances, there is some probability that the consumer may guess at a relationship based on peripheral cues (e.g., two technical attributes) and use this relationship to make inferences. The specific inferences made would look similar to those made on the basis of an affirmative knowledge of the correlation between two attributes. However, one may expect differences in the confidence with which the evaluations based on these inferences are held. Since it is likely that an inferred attribute value will differ from the actual value, the contingent evaluations may also be different. If the inferred value is more favorable, this is likely to raise the overall evaluation of a brand relative to the baseline situation, and increase the likelihood of choosing that brand. Conversely, if the inferred value is less favorable, the overall evaluation may be lower relative to the baseline situation. Hence, the likelihood of choosing the brand may be reduced.

In the third case, when the consumer knows that two attributes are correlated, the information acquired during search may differ from the cases when the consumer knows there is no correlation, or when he or she is uncertain about the correlation. Knowing the correlation, the consumer may be more likely to use it to reduce search effort. The consumer can make inferences about one attribute, based on the values on the other attribute. These inferences will in turn affect overall evaluations and choices as discussed above.

Since some inferences may be made, relying on correlation, confidence will be lower than in the baseline case (i.e., when there is no correlation). However, there is likely to be greater confidence associated with the inferences and subsequent evaluations, relative to the case when the consumer is uncertain about the presence or absence of correlation between two attributes.

The Role of Background Factors

The general mechanism proposed above is likely to be moderated by the influence of a variety of background factors. For example, all other things being equal, a consumer who is under time pressure and cannot conduct an exhaustive search should have a greater tendency to use knowledge of inter-attribute correlation as a means of reducing search effort.

Search cost is a related concept that may accentuate the use of inter-attribute correlational knowledge in the context of a consumer search and decision task. We would expect that when it is more difficult, time-consuming or otherwise effortful to acquire information, the consumer may search more parsimoniously using correlational knowldege to infer some items rather than exhaustively searching them.

The extent to which a consumer is involved in the decision task may also mediate the use of correlational knowledge during information search. When task involvement is low, the person is less likely to search and evaluate products with extensive effort (e.g., a gift purchase for a casual acquaintance). In such instances, the cost of error may not weigh heavily on the consumer's mind. Hence the use of correlational knowledge to cut down search effort is more likely. In contrast, if the consumer is highly involved in the task (e.g., a purchase for a close friend or a family member), the consumer may search more exhaustively to make a well-reasoned choice. This, of course may reduce the likelihood of correlational knowledge being used to save search effort.

Finally, one can imagine instances when the presence or absence of other forms of product class knowledge can moderate the use of correlational knowledge. For example, when consumers do not comprehend what specific product class terminology means, they may attempt to apply generalized correlational knowledge (e.g., a price-quality association) to interpret a brand's values on the ill-comprehended attribute. This type of moderating effect is particularly interesting since it illustrates even more vividly the value of taking a disaggregated view of product class knowledge.

Summary

The literature review and discussion in this chapter has developed more specifically the issues pertaining to how consumers use knowledge of inter-attribute correlations in decision tasks. The evidence suggests that correlational knowledge may be used as a basis for inferences that then influence search patterns for one of a pair of correlated attributes. When this happens, less information will be acquired about a brand and this in turn may affect evaluations of the brand. Consequently, either through these evaluations, or more directly through the application of specific choice heuristics that utilize correlation-based inferences, brand choices may be affected.

It was also argued that time pressure, search cost, involvement and other types of product category knowledge can be expected to moderate the above process. The next chapter develops formal conceptual hypotheses regarding the issues discussed above. It also describes the design of a study that will empirically test these formal hypotheses.

CHAPTER 8

AN EMPIRICAL INVESTIGATION OF THE EFFECTS OF INTER-ATTRIBUTE CORRELATION KNOWLEDGE: CONCEPTUAL HYPOTHESES AND STUDY DESIGN

The preceding chapter described the empirical evidence on the role of inter-attribute correlational knowledge in a product category and also proposed a mechanism that explicated its role in guiding information search, consumer evaluations and product choice. Secondary effects on choice confidence were also predicted based on this mechanism.

This chapter lays the basis for a formal empirical investigation of the issues brought up in the previous chapter. We first develop the discussion from the previous chapter into a formal scenario that is useful for presenting the conceptual hypotheses that will be examined in the proposed study. Following this scenario, we present the conceptual hypotheses regarding the effect of inter-attribute correlation knowledge on information search, product evaluation and choice. Hypotheses are also presented about secondary effects on confidence. Finally, we present the design of the proposed study that will test these hypotheses. While conduct of the study is outside the scope of this dissertation, we will nevertheless discuss the expected findings and their implications for future research on the role of product category knowledge in consumer judgment and choice.

Inter-Attribute Correlations: Use in a Consumer Decision Scenario

In this section, we describe a scenario involving a consumer who wants to buy a stereo. This person is considering a fairly large set of brands, each described on a number of different attributes. Previous studies of consumer choice in such scenarios (Lussier and Olshavsky 1979, Payne 1976, Bettman and Park 1980) have found that when such choices are stimulus-based (i.e. based on externally available information only), consumers go through an elimination stage in which unacceptable brands are eliminated on the basis of some processing criterion, leaving only a subset of brands for further consideration. Choices are made in a second phase. In more detailed studies, (Biehal and Chakravarti 1986), it is further found that the elimination phase is mainly attribute-based. The subset of brands that remain may be processed by brand, or compared pairwise on other attributes. Chosen brands are often reviewed immediately before the final decision. The purpose of this review may be to ascertain previously unexamined attribute values prior to a final commitment.

Depending on specifically what the consumer knows, the choice may processed in a number of ways over and beyond the two-phase process described above. For example, when the consumer has knowledge of attribute importance, brands may be first examined on the most important attribute. Only a subset of brands that pass cut-off values on an attribute may be examined further. Thus, if power is the most important attribute, only those stereos with output power exceeding, say, 50 watts, may be examined. Alternatively, the consumer may set up criterion levels for each attribute. Only brands that meet those criteria may be searched further. Thus, the consumer may proceed with known cut-offs on other attributes such as distortion, warranty or even a price cut-off in the form of a budget limit.

The above "choice heuristics" use particular operations or elemental rules and usually lead to only a partial search for brand information (Klayman 1983). Consumers could also reduce search effort by relying on the knowledge of a correlation between two stereo attributes and conduct a detailed search on only one of them. The other attribute values may then be inferred. Thus, say a consumer knows that stereos that are high on power are also the ones that have lower distortion. The consumer who knows this relationship may examine only brands that have high power, making the implicit inference that a brand's power level can be used to predict its distortion level. Thus, for a brand with high power, the consumer may infer that the distortion is low.

As an example of another consumer use of correlational knowledge, the consumer may know that stereo prices and warranty periods are correlated such that high priced stereos tend to have longer warranties. As has been suggested previously, the consumer may examine brands that have high prices, and infer that warranty period is longer without necessarily examining each brand's warranty period.

Just as the knowledge of a correlation permits inferences about a correlated brand-attribute value without actual search for the information, the known absence of a relationship means that the value on one attribute cannot be predicted by using the value on another attribute. In this case, both attributes are more likely to be searched in as much as they are important for an informed choice. Thus, if warranty is known to be uncorrelated with price, and is also a significant attribute, it will be searched during choice. In summary, inter-attribute correlational knowledge can be judiciously used by a consumer to reduce search effort during choice.

The Role of Background Factors

We will now extend our stereo search example to illustrate the likely impact of some background factors. If the consumer is under time pressure, there are natural constraints on the time available for search. Consequently, this consumer would look for ways to reduce search effort. Hence, the use of inter-attribute correlational knowledge may be accentuated. In contrast, when time pressure is low, there is time for more exhaustive search, and the use of correlational knowledge is less likely.

As a second background factor, the consumer's level of involvement in the decision may similarly mediate the extent to which correlational knowledge is used during search. When task involvement is low, less effort is likely to be expended, and the consumer may be willing to accept some margin of error in the decision. In this case, the consumer may be more likely to rely on correlational inferences as a way to reduce the extent of search. Conversely, when involvement is high, the consumer may be more motivated to search carefully. As shown later, the manipulation of level of involvement by altering the personal relevance of the task (e.g., Petty, Cacioppo and Schumann 1983), is likely to produce the effect discussed.

In summary, background factors such as time pressure and level of involvement may affect the likelihood of using correlational inferences to achieve parsimony in search. When the correlation between two attributes is known, that knowledge is more likely to be used in search under high time pressure and/or low involvement. The consumer may not acquire information on both correlated attributes. But when time pressure is low, and/or involvement is high, there is less need for the consumer to use correlation in search. In this case, the brand-attribute values are more likely to be examined exhaustively.

Inter-Attribute Correlational Knowledge and Product Evaluations

The preceding section established that inter-attribute correlational knowledge may lead to search patterns such that information on an attribute is not acquired. We will now extend our example of the consumer shopping for a stereo receiver to illustrate how such effects of correlational knowledge on information search may impact upon the overall evaluations of specific brands.

In the stereo choice situation, as in most other consumer decision scenarios, a low price would be favored over a high price if all other things are equal. However, as is occasionally the case, stereo prices may be positively correlated with their warranty periods. Thus, more expensive stereos may have longer warranty periods whereas inexpensive ones may have shorter warranty periods. While most brands may exhibit such a relationship (i.e., have high prices and high warranty or low prices and low warranty), an occasional brand may offer the very desirable combination of a low price and high warranty. If the consumer only acquires information on stereo prices and uses knowledge of a positive correlation to infer warranty values, then this latter brand with the "unusual" low-price, high-warranty combination would be perceived to have low warranty. However, a search of objective warranty information would eliminate the possibility of such inferences. Thus, it logically follows that when information search is supplanted by correlationally-based inferences, evaluations of brands whose brand-attribute values violate the perceived correlation will be affected significantly.

The above illustrated the effects on evaluation of a fairly common inference from price to another evaluative dimension of a product. Similar inferential processes may occur between non-price attributes as well. For stereos in particular, receivers that have high distortion may tend to have low power output, while those that have low distortion tend to have greater power output. Knowledge of such a relationship may lead a consumer to acquire information on only the distortion level of stereos and then use the correlational knowledge to infer values on output power. As before, a brand that violates this expected relationship may be evaluated differently than if its attribute values were exhaustively searched.

Inter-Attribute Correlational Knowledge and Brand Choice

The use of correlational knowledge to save search effort may affect the choices that consumers make. For example, a consumer making an early price-quality inference may search only the more expensive brands and confine his or her choices to this subset and ignore low-priced alternatives. This may lead to sub-optimal choices in some instances and merely "different" choices relative to other instances in which information is exhaustively collected.

We note that these postulated choice effects may or may not be mediated by explicit evaluations. In some cases, as is the case with specific choice heuristics, evaluations may not even be formed for some brands (Bettman 1979). Moreover, what brand is chosen is also likely to be sensitive to the available configuration of brand-attribute values and to whether or not correlational knowledge-driven inferential processes violate the objective relationships that exist between brand values on the correlated attribute.

Secondary Effects on Confidence

The inferential process that is presumed to guide search in our consumer decision scenario acknowledges that the savings in search effort are accompanied by an increased likelihood of error. Consumers who rely upon correlationally-driven inferences do not acquire all available attribute information. Hence, there may be some residual uncertainty in the consumer's mind about the predictive certainty of the relationship. Therefore, relative to when judgments and choices are made on objective information, lower levels of confidence would be associated with inferentially-driven judgments and choices (See Dick 1985 for an example of this phenomenon).

In the absence of correlational knowledge, or when background factors do not influence the evocation of such knowledge, objective information is more likely to be acquired. A consumer who comprehends this information may be more confident about the quality of evaluations and choices. Thus, a consumer who is highly involved, is not under time pressure and who does not know the correlational shortcuts to search, will presumably search for objective information. On the other hand, an uninvolved consumer under time pressure, would use available knowledge of inter-attribute correlations to cope with the task. This efficiency in task performance should be accompanied by some uncertainty regarding the judgments/choices made.

It is interesting to speculate about how an uninvolved consumer, under time pressure but not aware of inter-attribute correlations may perform the task. One would suspect that some other effort-reduction heuristic may be used. Confidence levels associated with the resultant evaluations/choices would depend on the heuristic used.

Conceptual Hypotheses

The preceding discussion sets the stage for the conceptual hypotheses presented in this section. We will examine and contrast the effects of knowing the presence/absence of a strong correlation between two attribute in a product category. Moreover, we will examine how these effects are accentuated/attenuated by background factors such as high/low involvement levels in the decision task and the presence or absence of time pressure. The dependent variables to be examined are the amount of search, the evaluations of a given set of brands and the actual choices made. Effects on a secondary dependent variable, confidence in the evaluations/choices, will also be considered.

Effects on Search

H1: Consumers who know of a high correlation between two attributes in a product category will conduct less total search on the two attributes, relative to consumers who know that the attributes are not correlated.

H2: The reduction in the total search on two attributes, that stems from the knowledge of a correlation between them, will be greater when consumers are making decisions under high time pressure relative to when they are not under time pressure.

H3: The reduction in the total search on two attributes, that stems from the knowledge of a correlation between them, will be greater when the consumer's involvement level in the task is low relative to when it is high.

It should be noted that the two background factors, time pressure and involvement, are expected to have independent main effects on search. Thus, both high time pressure and low involvement levels will reduce search. These main effects are implicit in the two panels that graph the predictions of H1-H3 in Fig. 8-1. While triple interactions involving correlational knowledge, involvement level and time pressure may occur, the nature of these effects is difficult to predict. Hence, we will offer hypotheses only about the two-way interaction terms.

Effects on Evaluations

Contingent upon the search effects outlined in H1-H3, we make the following predictions regarding the effect of correlational knowledge on evaluations:

H4: Consumers who know of a high correlation between two attributes in a product category will assign different evaluations to brands whose attribute values violate that expectation relative to consumers who know that these attributes are not correlated.

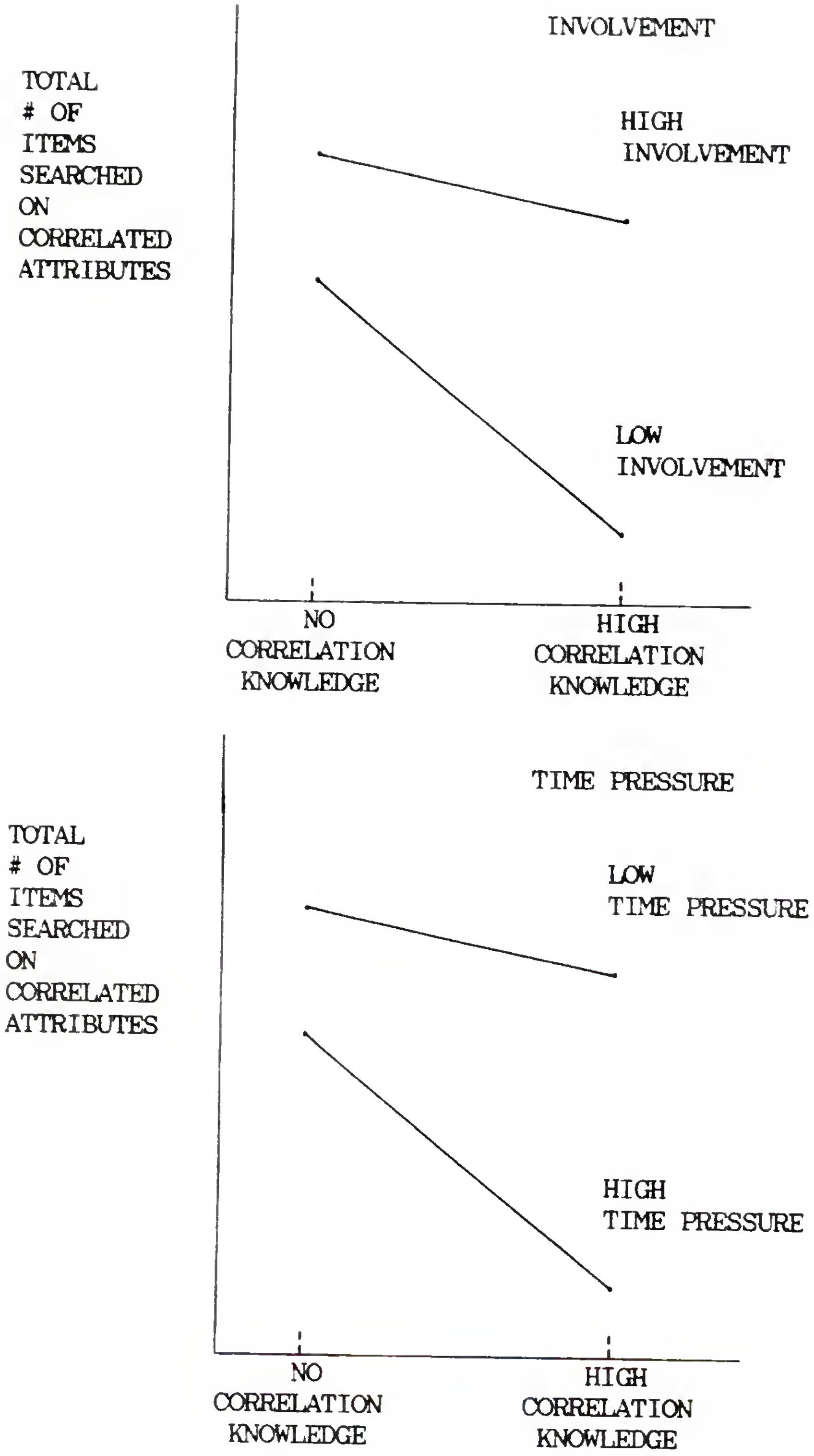


Figure 8-1
Effects of Correlational
Knowledge on Search

H5: The differences in the evaluations of brands that stem from knowledge of inter-attribute correlations will be greater when consumers are making decisions under high time pressure relative to when they are not under time pressure.

H6: The differences in the evaluations of brands that stem from knowledge of inter-attribute correlations will be greater when the consumer's involvement level in the task is low relative to when it is high.

Effects on Choices

H7: The brands chosen by consumers who know of a high correlation between two attributes in a product category, will be different compared to the choices made by consumers who know that the attributes are uncorrelated.

H8: The brand choice differences stemming from inter-attribute correlational knowledge will be accentuated when consumers perform the choice task under high time pressure relative to when there is no time pressure.

H9: The brand choice differences stemming from inter-attribute correlational knowledge will be accentuated when consumers are less involved in the decision task relative to when they are more involved.

It is of course important to note that these choice predictions assume specific configurations of brand-attribute values that make evaluations sensitive to the search mechanisms discussed earlier. It is implicit that the brand choice differences will stem from variations in the choice probabilities of brands that violate the expected correlation on the basis of which inferences are made.

Secondary Effects on Confidence

Also contingent upon the search hypotheses and based on whether or not evaluations were made on the basis of objective information or inferred attribute values, it is possible to postulate effects on confidence in the resultant evaluation and choices. Subjects will be more confident about their choices when these are based on objective information, compared to the case when they rely on correlation to reduce search effort. Thus we have:

> H10: Consumers who know that an inter-attribute correlation exists in a product category will be less confident in their choices relative to their counterparts who know that the correlation does not exist.

While the above hypothesis is seemingly counter-intuitive, it should be noted that the prediction follows if one considers that greater search and gathering of objective information is conducted by the no-correlational knowledge consumers relative to the inference-prone high-correlational knowledge consumers. Thus, search is postulated to mediate these secondary effects on confidence.

> H11: The differences between the confidence levels that stem from inter-attribute correlational knowledge will be accentuated when consumers make the decision under high time pressure relative to when they are not under time pressure.

H12: The differences between the confidence levels that stem from inter-attribute correlational knowledge will be accentuated when consumers are less involved in the decision, relative to when they are more involved.

Note, as before, that H11 and H12 concern interactions between correlational knowledge and time pressure and involvement level respectively. Moreover, these statements regarding confidence variations apply both to brand evaluations and choice. However, here too, it is important to keep in mind that these effects are presumed to be mediated by search. To the extent that search patterns are complex and not uniform across brands, some of these effects may be difficult to pin down in a reasonably realistic choice task context.

Design of the Proposed Study

The proposed study will use a 2x2x2 between-subjects design in which three factors will be manipulated, each at two levels. These are (1) knowledge of inter-attribute correlations (high versus low), (2) whether or not the task is performed under high time pressure and (3) whether the consumer's level of involvement in the task is high or low. We will first overview the study setting and then describe each of the manipulated factors and explain their operationalizations.

The Study Setting

The study centers around the choice of a stereo receiver based on information acquired from a computerized product information base. Depending on the study condition, some subjects are told that they are purchasing the stereo receiver as a birthday gift for a favorite relative (high involvement), whereas others are told that they are merely helping a friend choose a gift for a relative (low involvement). This gift choice scenario permits the use of experimenter-specified attribute weights (Biehal and Chakravarti 1982, 1983, 1986; Brucks and Chakravarti 1987). Subjects choose from a set of 15 receivers described on six attributes. Some subjects make the choice under time pressure (an incentive to meaningfully complete the task in under ten minutes) whereas others choose without such time pressure. Finally, knowledge of inter-attribute correlations is manipulated by instructions. Thus, some subjects are told that two pairs of stereo attributes are highly correlated whereas other subjects are told that they are not correlated. This information is attributed to a highly credible source. Also, the brand-attribute values in the computerized information base are configured such that the inter-attribute correlations that are manipulated are within credible ranges. Moreover some "target" brands violate the expected inter-attribute correlational patterns.

The subjects are asked to make the best gift choice in conformity with the experimenter-specified attribute weights, based on information that they acquire sequentially from the computer. The dependent variables of interest concern the amount and pattern of search, post-task brand evaluations, the actual choices made in each experimental condition and the confidence associated with the choices.

In each of the following sections, we describe the specific aspects of the study.

The Stimuli

As described above, the stimuli are a set of fifteen stereo receivers branded A-O. Each stereo is described on six attributes, price ($), warranty (months), distortion (%), power (watts), an index for frequency response and an index for signal-to-noise ratio. A blend of qualitative and technical characteristics was used in order to maintain a reasonable level of task complexity. The brand-attribute values are stored in a computer information base from which they can be acquired one item at a time on the monitor screen. The specific brand-attribute values are shown in Table 8-1.

The matrix of brand-attribute values was developed with two goals in mind. First, no brand was clearly dominant and hence choice would involve a resonable amount of search. Second, the values were chosen such that the inter-attribute correlations were as shown in Table 8-2. The key correlations are those between price and warranty (+0.50) and between distortion and output power (-0.50). All other correlations were between (±0.20) and thus, were of negligible magnitude. Thus, the key correlations (price-warranty and distortion-power), were high enough to permit a credible strong correlation assertion. At the same time, they were low enough that they would remain undetected if the consumer were told that no correlation was present (Alloy and Tabachnik 1984, Bettman, John and Scott 1985). This configuration of correlations was developed by trial and error.

If one assigns equal weights to the six attributes, brands E, F, J and K seem to emerge as being among the best choices. It should be noted that brand F (low price and high warranty) violates the stated (positive) correlation between price and warranty. Similarly, brand J (low distortion and low power) violates the stated correlation (negative) between distortion and power. Note that brand E has a

Table 8-1
The Stimulus Matrix

	ATTRIBUTES					
	Price	Warranty	Distortion	Power	Frequency Response	S/N Ratio
	($)	(Mos.)	(%)	(Watts)	(Index)	(Index)
BRANDS						
A	150	2	.04	20	20	50
B	200	2	.01	60	40	20
C	250	3	.02	80	50	20
D	250	4	.05	40	30	30
E	350	6	.01	80	30	40
F	150	6	.02	80	40	30
G	200	3	.05	60	30	40
H	250	2	.01	100	10	30
I	300	6	.05	40	20	20
J	250	6	.01	20	40	30
K	250	5	.01	100	40	30
L	300	4	.03	20	30	20
M	200	4	.02	100	20	20
N	350	5	.02	60	10	30
O	350	6	.03	20	40	30

Table 8-2
True Inter-Attribute Correlations in Stimulus Matrix

	Price	Warranty	Distortion	Power	Freq. Resp.	Signal to Noise Ratio
Price	1.000					
Warranty	0.499*	1.000				
Distortion	-0.087	-0.062	1.000			
Power	-0.172	-0.140	-0.494*	1.000		
Frequency Response	-0.134	0.189	-0.192	-0.078	1.000	
Signal to Noise Ratio	-0.178	-0.089	0.184	-0.162	-0.203	1.000

* denotes the key correlations pertaining to the attributes whose stated correlations were experimentally manipulated.

profile that is similar to brand F except that its price-warranty relationship strongly conforms to the stated correlation. Similarly, brand K has a profile similar to brand J. However the distortion-power relationship strongly conforms to the stated correlation. Each of the remaining brands is flawed in one or more ways. Thus, brands E, F, J and K are significantly more desirable than the remaining brands. However, since their attribute scores vary in ways that violate the expected correlations in some study conditions, the frequencies with which they are chosen are expected to vary. Thus, when high correlations are expected between price and warranty, brand F is less likely to be searched and/or chosen. Similarly, brand J's low power score may not hurt as much if subjects infer that this score must be good since it has a low distortion score. This should cause variations in the probability with which it was chosen in the various study conditions. We will return to specific discussions of these later in the chapter.

Key Manipulations

In this section, we discuss each of the manipulated factors and explain their operationalizations.

Correlational knowledge

Knowledge of inter-attribute correlations is manipulated through study instructions. Subjects are given summary information attributed to an article in High Fidelity magazine. In the High correlation condition, subjects are told about a positive price-warranty relationship and a negative relationship between distortion and output power. A brief technical explanation is provided to justify the existence of the relationship between these attributes. In contrast, subjects in the no-correlation condition are told that there is no relationship between these or other pairs of attributes. As stated earlier, the true correlations in the stimulus matrix are such that the manipulation may be sustained successfully (see Appendix 5, Part A).

The involvement manipulation

The relative amount of effort that a subject puts into the search associated with a decision task is likely to depend on the consumer's level of involvement. While there is significant controversy about what exactly involvement means at a conceptual level (Cohen 1983), it is nevertheless understood that in a given consumption situation, involvement may depend on a number of factors, such as the physical characteristics of the stimulus object or situation, the person's enduring interests or values, and situational differences (See Zaichkowsky 1985; Clarke and Belk 1979; Houston and Rothschild 1977; Belk 1981 and Lastovicka 1979). However, one rather popular approach to manipulating involvement is to place subjects in decision tasks with varying levels of personal relevance (Petty and Cacioppo 1979, Petty, Cacioppo and Schumann 1983).

Several considerations entered the choice of the specific involvement manipulation. The choice of stereos as the product class follows use of a stimulus product with which the target convenience sample is familiar (in terms of ownership and usage) and yet not fully aware of likely relationships between attributes. This permits the use of a relevant product that maintains baseline levels of involvement and yet permits a credible correlational knowledge manipulation.

The strategy used to manipulate involvement in this study places subjects in a gift choice situation of varying personal relevance. Subjects in the high(er) involvement group will be asked to imagine that the stereo receiver is to be purchased as a gift for a favorite relative for a special occasion (e.g. birthday). In the low(er) involvement condition, subjects will be asked to assume they are helping a casual friend purchase a gift for his or her relative.

A second consideration in using the involvement manipulation is a possible tendency to buy a low-priced product when the choice situation is low in personal relevance. Similarly, there is the possibility of a higher-priced brand being purchased in a highly personally-relevant situation. This potential confounding is avoided by setting a high budget of $400 that can accommodate each of the stimulus brands. This should control the tendency to buy the cheapest brand as a function of the situation. At the same time, task instructions that emphasize getting good value for money should eliminate the propensity to buy an expensive brand that is dominated on other attributes as well. The reader is referred to Appendix 5, Part B, for the detailed instructions.

The time pressure manipulation

A good time pressure manipulation is somewhat difficult since several considerations must be met. While subjects should feel the time pressure, it should not dissuade them from performing the task in a meaningful way. Thus, the subjects should be motivated by an incentive to finish quickly as in a hurried shopping trip and yet not feel a sense of unrealistic detachment from the error-effort trade-off because they are in an otherwise costless experimental scenario.

Some guidance on a time-pressure manipulation in information search tasks is available in the literature. Thus, Arch, Bettman and Kakkar (1978) manipulated time pressure whereby some subjects performed the task under no time pressure. However, other subjects were first asked how much time they wanted for the task and were then given half the time that they had asked for. These subjects reported feeling they were under high time pressure.

In our proposed study, we follow a similar approach. Subjects in the low time pressure condition will be allowed to proceed at their own pace in the search/choice task. The subjects in the high time pressure condition will be given a fixed amount of time to complete the task. Based on some informal pre-tests, these subjects will be given a limit of 10 minutes to finish the choice task. This is approximately half the time taken by subjects who are allowed to work at their own pace. At the same time, it is necessary to set some type of choice quality criterion to ensure some baseline level of task performance. In summary, so as to implement this time pressure manipulation with the right incentive level, subjects will be told that they will receive a $1 bonus if they can meet two necessary conditions. First, they should be able to pick one of the eight better brands out of the 15 brands in the consumer information base and second, they should finish within 10 minutes in the high time pressure condition and within 60 minutes in the low time pressure condition.

We believe that this set of criteria achieves the twin objectives of maintaining a basic level of task involvement without creating an urge for subjects to go overboard in terms of conducting exhaustive search. Thus, in the high time pressure condition, the $1 incentive can be earned only by finishing quickly. But in the low time pressure condition, subjects may take upto an hour if they wish. However, as in all such experimental situations, more pre-testing will be needed to pin down this manipulation exactly. Appendix 5, Part C, shows the instructions that will be used to implement this manipulation.

Subjects

This empirical study investigates basic processes in the use of knowledge in search tasks. As such, it is felt that student subjects picked from an undergraduate population in a large state university would not be an inappropriate convenience sample. Moreover, it is expected that the use of a homogeneous group such as this would eliminate other sources of error that may affect the ability of the study to detect the basic effects of interest. The subjects will be paid a basic fee of $3 for participation and may earn the $1 bonus by meeting the task performance stipulations described earlier.

Experimental Procedures

Subjects will be randomly assigned to one of the eight experimental conditions in the study. All subjects will first be given a general orientation sheet to familiarize them with the basic purpose of the task and to obtain their informed consent to participate (see Appendix 6). Following completion of these formalities, they will be given a warm-up task to familiarize them with the interactive computer program that they will use in the choice task. Presently, this warm-up task asks them to search for information on some hypothetical pocket calculators described on six attributes. Subjects will be allowed to practice this task until they feel comfortable using the computer.

Following completion of the warm-up task, subjects will be given orienting information providing brief explanations of the actual experimental task along with descriptions of the attributes used to describe the stereos in the computer information base (see Appendix 7). Following this, they will receive more general instructions embedding the correlation manipulation (Appendix 5, Part A). Finally, they will receive the choice task instructions (Appendix 5, Parts B and C) which will embed the time pressure manipulation discussed earlier.

Subjects will then be permitted to search sequentially for information about stereo receivers. As stated earlier, the brand-attribute values stored will have information on 15 brands (denoted by the letters A-O) on the six attributes described earlier. The letters A-O and the list of attributes will be displayed continuously on the screen while the subject is searching (see Appendix 8). Subjects will be able to obtain an item of information by specifying the brand i.d. letter and the attribute i.d. number in any order. The item requested will then be displayed. The ability to specify brands/attributes in any order provides flexibility, and avoids guiding search to be either by brand or by attribute.

Based on the experience gathered by other researchers (e.g., Brucks and Chakravarti 1987), subjects will not be allowed to take notes as they search. Permitting them to take notes often structures the task as filling out an external brand-attribute matrix and interferes with the basic processes being investigated. However, task instructions, while present on the monitor screen, are also made available for easy reference.

Subjects are free to search for as much or as little information as they wish. Input errors are rejected by the program and are accompanied by an user-friendly error message and a re-input prompt. Examples of these are included in Appendix 8 which shows a sample run for the high correlation, high time pressure and high involvement condition.

At any point during the search task, the subject may decide to end the process. At this time, the subject is administered a paper and pencil questionnaire. This questionnaire records the subjects' brand choice, obtains brand evaluations and confidence measures, collects answers to manipulation checks and task perception questions and also uses items intended for classification purposes. This questionnaire is presented in Appendix 9.

Operational Hypotheses and Dependent Measures

The conceptual hypotheses to be tested in this study have been outlined previously. Before proceeding to translate these into operational hypotheses and indicating the specific dependent measures to be analyzed, we will first outline the manipulation checks to be conducted based on responses gathered by the final questionnaire (Appendix 9).

The inter-attribute correlational knowledge manipulation will be checked by analyzing the responses to Question 8a-e. Subjects in the high correlational knowledge condition should indicate greater agreement with Q8a and disagreement with Q8c relative to those in the no correlation condition. As a corollary check, responses to Q8b, and Q8d and 8e should not vary by study condition. The time pressure manipulation will be checked via responses to Q5a and Q5b. Similarly, the involvement manipulation will be checked via responses to Q3 and Q6. In both cases, inter-item correlations will be assessed for the two scales before they are summed and the mean scores compared. The direction of expected differences by condition is fairly obvious.

After ensuring that key task performance criteria are met (e.g., ensuring via responses to Q4 that subjects assigned approximately equal weights to the six attributes as instructed), we will proceed to tests of the conceptual hypotheses. However, before the formal tests are developed, we outline our basic expectations regarding how the task will proceed in each condition.

Expected Modal Search Patterns and Choices

The majority of the proposed subjects are expected to be unfamiliar with the key technical attributes of the stereos. Given this, and the fact that the stereos in the information base are hypothetical, it is unlikely that subjects will use conjunctive cutoffs to a significant extent during choice. The assignment of equal weights to the attributes also makes lexicographic processes unlikely. Consequently, these background parameters may incline subjects to using a compensatory pattern to process the given information. We expect that in the no-correlation condition, search will be fairly exhaustive and compensatory types of brand-based evaluation may be common. This is particularly likely when time pressure is low and subjects are highly involved in the task.

However, when subjects know of the existence of high (positive) price-warranty correlation and a high (negative) distortion-power correlation, they may be prone to use this information to draw inferences and reduce search effort. At least four possible inferential strategies are likely: (1) Search price and infer warranty, (2) search distortion and infer power, (3) search warranty and infer price, and (4) search power and infer distortion.

While variations are likely in the above strategies, it is reasonable to assert that a subject will make unidirectional inferences and constantly search the same attribute of a correlated pair and infer the other. Thus, price may be used to infer warranty and we are assuming that a subject who has adopted this strategy is unlikely to then reverse modes and use warranty to infer price. Apart from being somewhat confusing, such an approach necessitates making inferences for two attributes before brands can be compared. This increases task performance effort and does not seem likely. Finally, when time pressure is high, and level of involvement is low, subjects' use of correlational knowledge is expected to go up.

While search patterns are difficult to predict and contingent choice predictions are even harder, some general expectations may be developed about potential brand choices in the various study conditions. If search is reasonably exhaustive and the choices are made in approximately compensatory fashion, the stimulus configurations in Table 8-1 suggest that the decision is likely to boil down to a choice between brands F and K. These two brands score at or near the top on most attributes. While they are not dominant brands, they perform well on a compensatory basis.

We next consider how search will evolve when the subject begins to use correlational knowledge to guide the search and choice. We will now identify the emergent choices for each possible assumed correlational pattern.

Under Pattern 1, the subject would be expected to search the prices of brands and then infer their warranty scores on this basis. If the subject chooses to look only at brands at the two high price points, E, N and O would be at $350 and I and L would be at $300. Of these brands, subsequent search should eliminate I due to its high distortion and low frequency response. Also, since L and O have high distortion and N has low frequency response, these brands should also be eliminated. This would leave E as a viable choice candidate in this case.

Under Pattern 2, subjects would search distortion scores for the brands and infer their power values. Thus, brands with high distortion scores may be eliminated, leaving brands B, E, H, J and K as the ones with the best distortion scores. Of these brands, B, H and K have low warranties. Moreover, B has a low signal to noise ratio and H has low frequency response. These brands should be eliminated. E's high price is likely to hurt it, leaving brand J as a high probability choice in this situation.

Patterns 3 and 4 are less likely due to contiguity factors in the stimulus presentation. Nevertheless, we consider Pattern 3 where the subject searches warranty first and screens on this attribute. An initial consideration set may be defined by brands E, F, I, J and O, each of which has a 6 month warranty. Brands K and N with 5-month warranties may also be considered. In further search, the subject would learn of the distortion, power and frequency response inadequacies of brands I, O, J and N. Thus, E, F and K would be viable candidates. However, if the subject checks price, E should be eliminated and choices would then focus on brands F and K. At a second level, however, if the subject also uses the distortion-power correlation to avoid searching power, J would escape elimination and appear as an intrusion in the choice.

Finally, under Pattern 4, the subject may search power and infer distortion values. If brands are then screened on their power score, brands H, K and M have the highest scores whereas C, E and F are also quite high. Notice that here J would be eliminated early because of its low power score. If the remaining brands are searched exhaustively, C, E, H and M would be eliminated, leaving F and K as the viable choices. On the other hand, a second level inference from price to warranty may create the possibility of observing brand E choices as intrusions in this case.

Thus, in summary, when subjects know that there is no correlation and they have the time and the involvement level to search exhaustively, F and K should emerge as the modal choices. However, when subjects know of a high correlation between price and warranty and distortion and power, their search heuristics would vary, creating choice variations. Subjects who infer warranty based on price may choose E. Subjects who infer power based on distortion may choose J.

Other approaches as shown above can lead to J or E intrusions as well. Thus, in the high correlation condition, J and E choices are expected to occur with greater frequency. In the next section, we present the operational tests of the hypotheses and the measures to be used for the same.

Tests of the Search Hypotheses

Hypotheses H1-H3 concerned the likely search patterns. Two dependent measures will be constructed from the subjects' information acquisition records. Measure 1 will examine the total number of price and warranty information items searched. Measure 2 will examine the total number of distortion and power information items searched. Each measure will be subjected to an analysis of variance as a function of the three 2-level factors, correlational knowledge, time pressure and involvement, and their two and three-way interactions.

According to Hypothesis H1, subjects in the high correlation condition should have significantly lower scores on both Measures 1 and 2 relative to subjects in the no correlation condition. This is because we expect that correlational knowledge should result in only one of a pair of correlated attributes being searched.

By Hypotheses H2 and H3, one would expect each of Measures 1 and 2 to exhibit significant ordinal 2-way interactions between the correlational knowledge manipulation and the time pressure and involvement manipulations respectively. Thus, for each measure, the decrease in search from no to high correlation knowledge should be greater when time pressure is high versus low, or when the subject has low versus high levels of involvement.

While explicit hypotheses have not been presented here, additional search measures that look at the total number of items searched from the stimulus matrix as also search by attribute will also be developed and analyzed.

Tests of the Evaluation Hypotheses

Hypotheses H4-H6 concerned the evaluations received by brands. The measures for these tests are derived from the brand evaluations provided in Q2 of the task questionnaire (Appendix 9). The specific evaluations of interest are those for brands F and J whose attribute values (price/warranty and distortion/power respectively) violate the stated correlation patterns. These two evaluation measures will be subjected to separate analyses of variance as functions of the three manipulated factors and their two- and three-way interactions.

According to Hypothesis H4, subjects in the no correlation condition should rate brand F higher and brand J lower than their counterparts in the high correlation condition. A significant ordinal two way interaction is expected in H5 between correlation knowledge and time pressure. The evaluation differences between the two correlational knowledge conditions should be enhanced under time pressure. Similarly, by Hypothesis H6, there should be a significant ordinal two-way interaction between correlational knowledge and involvement. The evaluation differences between the two correlational knowledge conditions should be enhanced when the task involvement is low.

Tests of the Choice Hypotheses

The premises underlying the choice predictions have been presented previously. The central argument hinged around the variations in choice likelihood of the "target" brands F and K and the "decoy" brands E and J. Three measures (the proportions of F and K choices, the proportions of E and J choices and the proportion of "other" choices) will be developed and subjected to a log-linear analysis of variance under the CATMOD procedure in SAS (Version 5) as a function of the three two-level manipulations and their two- and three-way interactions.

According to Hypothesis H7, choice proportions for brands E and J are expected to be higher for subjects in the high correlational knowledge conditions relative to the no-correlation conditions. Moreover, H8 and H9 predict two-way ordinal interactions between the correlational knowledge factor and the time pressure and involvement manipulations respectively.

Tests of Secondary Confidence Effects Hypotheses

Hypotheses H10-H12 concern secondary effects on the confidence with which brand evaluations and choices are made. Q1 and Q2b in the task questionnaire (Appendix 9) assess confidence in the choices and the evaluations respectively. Each of these measures will be subjected to an analysis of variance as a function of the three manipulated factors and their 2-way and 3-way interactions.

By Hypothesis H10, subjects in the high correlation condition should be significantly less confident than subjects in the no correlation conditions as a consequence of the latter's more exhaustive search. By Hypothesis H11, a significant 2-way interaction is expected between the correlation manipulation and time pressure. A similar 2-way interaction is expected between the correlation manipulation and the involvement manipulation. Thus, the decline in confidence between the no and high correlation groups should be greater when time pressure is high and also when involvement is low.

Summary and Conclusion

In this chapter, we have presented a set of conceptual hypotheses that postulate how knowledge of inter-attribute correlations in a product category may guide how consumers search for information, evaluate brands and make choices in a product category. The effects of two specific background factors, time pressure and involvement, were also postulated, as were secondary effects on the confidence with which brand evaluations and choices are made.

An empirical study designed to test these effects was also described. Detailed descriptions of how specific factors will be operationalized, the study instruments and measurement procedures were also included. While the conduct of the study was outside the scope of this dissertation, it is expected to be tested and executed in the near future. Even if some unanticipated factors necessitate modification of specific aspects of the design, this proposed study serves as a spring-board for an on-going research program investigating the role of other elements of our product-class knowledge taxonomy in consumer decisions.

CHAPTER 9
CONCLUSION

The purpose of this chapter is to highlight the key features of this dissertation and to develop a prognosis for the research stream that it has seeded. We begin by reviewing the research undertaken in this dissertation. The findings of the empirical study are summarized next. We then describe the contribution of this work to theoretical and substantive understanding of consumers' use of product class knowledge. The implications for marketers, consumers and public policymakers are discussed. Finally, directions for future research are considered.

Review of the Dissertation

The dissertation investigated the influence of consumer product class knowledge in the context of consumer choice. It postulated and empirically explored the impact of specific types of product knowledge on search, evaluation and choice. Examples of the likely impact of product class knowledge were drawn from the consumer environment. More formally, a review of the literatures in marketing, psychology and economics suggested that consumer knowledge can have important moderating influences on search, evaluation and choice. This review also suggested that the manner in which information is processed may in turn have secondary effects on consumers' confidence, as well as on recall and recognition.

Prior conceptualizations of product class knowledge reflected a lack of consensus about the meaning of "product familiarity," and about the measures that were used to assess this concept. Most of these conceptualizations involved an aggregate view of product class knowledge. The empirical work reviewed established the role of this variable in consumer decision making, but provided only a limited understanding of the specific roles played by particular elements of product class knowledge.

The key proposition developed in this thesis was that studies of consumer product class knowledge should take a disaggregate view. By identifying the different types of consumer product class knowledge, each may be linked to a role or function that it may serve in search, evaluation and choice. The disaggregate view permits the recognition of different functions for the various elements and provides a richer conceptual understanding of how various types of product class knowledge interact in consumer decision making. The dissertation also acknowledged that the functions of these types may be significantly moderated by background factors such as time pressure and the level of consumer involvement and by the structure or organization of this knowledge in memory.

A seven-part typology of consumer product class knowledge that built on a typology proposed by Brucks (1985) was then presented. Each type of knowledge was described and its function in consumer decision making was discussed. The specific dependent variables considered pertained to search, evaluation and choice, but secondary effects on confidence in evaluations and choices were also considered.

The empirical parts of this dissertation examined two specific aspects of product class knowledge--the range on an attribute, and inter-attribute correlation. Knowledge of the range of available attribute values was the first aspect examined. Based on a review of the literature, it was proposed that a consumer may use attribute range knowledge as a context to make provisional evaluations of brand-attribute values encountered in a sequential search situation. These provisional evaluations may then mediate patterns of subsequent search for information and may ultimately affect choices. Further, secondary effects were proposed on the confidence consumers had in their evaluations and choices as a consequence of this range knowledge-driven search and choice process.

Alternative accounts were considered regarding how the provisional evaluation may be made by consumers. Under one scenario, consumers lacking range information may uniformly discount evaluations. In another scenario, consumers may avoid making extreme evaluations and thereby "gravitate" to the middle of a response scale. Hypotheses for evaluation were developed based on these alternative accounts and a study was designed which would be capable of distinguishing between them. Hypotheses were also proposed for search behavior, confidence in evaluations and for special cases in which the range information given to a consumer was violated by available brand-attribute values. These hypotheses were then empirically examined.

The second aspect of consumer product class knowledge studied was that of inter-attribute correlations in a product category. The literature was examined in the areas of price-quality associations, inference-making by consumers, and the impact on search behavior. It was proposed that under conditions of high time pressure and low involvement in the decision, a consumer would tend to rely on knowledge of inter-attribute correlation to make inferences about missing information and may thus achieve parsimony in the information search process. Thus, when two attributes are known to be correlated, the consumer may examine one attribute, but avoid the effort of making an explicit search of the second attribute and rely on an inference based on the correlational knowledge. Given the appropriate configuration of available brand-attribute values, this may in turn lead to differences in brand evaluation, choice outcomes and confidence.

Formal conceptual hypotheses were developed from these discussions regarding consumers' use of inter-attribute correlational knowledge. An empirical study was designed to test these hypotheses. Although the conduct of this study was outside the scope of this thesis, its operational details and the key manipulations were fully developed and presented.

Summary of Empirical Results

The empirical study of consumers' use of range knowledge provided strong support for the mechanism that proposed search guided by provisional evaluations. In the absence of range information, subjects avoided extreme evaluations and also were significantly less confident in their judgements. Thus, range knowledge helped in evaluating newly encountered and not well-comprehended brand-attribute values by providing a context for judgement. As proposed, these provisional evaluations then appeared to mediate sequential search. Attribute-based search was more common when range was not known presumably to develop an implicit evaluative scale. But when range information was available, brand-based search was more frequent when consumers encountered favorably located brand-attribute values. Confidence in evaluations was higher when range was available as a context. Finally, when a brand profile violated the given range, subjects seemed to update the prior range knowledge without questioning its credibility. In summary, the presence or absence of range knowledge had significant impact on provisional evaluations, search and confidence measures. However, in this study, the specific width of the range had little impact.

The correlation study was not conducted under the auspices of this dissertation research. Consequently, no empirical findings are available at this time. However, the results of this study are expected to confirm our hypothesis of correlationally driven inference processes being used to achieve parsimony in information search. The contingent effects on evaluation, choices and confidence judgements should be demonstrated in this study.

Contributions of the Research

The findings of the range study strongly support the theoretical contention that a disaggregate approach should be taken in studying consumer knowledge. By recognizing the different facets of product class knowledge, it becomes possible to probe these more deeply in order to obtain a richer understanding of the role of such knowledge in consumer judgement and choice. The conceptual framework described herein enables examination of the effects of different types of knowledge on search, evaluation and choice. Moreover, the moderating role of background factors such as involvement, time pressure or knowledge structure can also be examined. Secondary effects on recall, recognition and confidence can also be explored.

Next, the seven-part typology of consumer product class knowledge is contrasted with earlier work that takes a disaggregate view, for example, the typologies proposed by Russo and Johnson (1980), Park and Lessig (1981) and Punj and Staelin (1983). The current typology extends the work of Brucks (1985), specifically, by adding attribute range knowledge and summary brand evaluations to that typology. These two important types of knowledge are likely to be available in consumer memory or in the environment. It is believed that their use in judgement and choice is a commonplace occurence.

The substantive findings of the study of range knowledge have already been summarized. Clearly, these have important implications for marketing practice and public policy measures. When consumers are evaluating technologically complex and unfamiliar product categories, a marketer may be able to influence brand evaluations by providing range information as a context. By means of promotional messages that focus on desirable brand-attribute values, it may be possible to influence the degree to which a target brand is examined. These effects may sometimes lead to inefficiencies in consumer judgements and choices. For example, when veridical range information is not available, inferior brands and products may be rated more favorably than they should be and consumers may fail to eliminate these from consideration.

Turning to knowledge of inter-attribute correlations in a product category, there has been relatively little work earlier examining how such information is actually used by consumers. This dissertation describes a mechanism that may underlie the use of inter-attribute correlation as a means of achieving parsimony in search. This dissertation has presented formal hypotheses for how search, evaluations, choices and secondary variables such as confidence may be affected. These hypotheses organize and also generalize some prior research done in the specific context of price-quality associations. While the key contribution of this study will be evident only after it is completed, the dissertation has documented a flexible, computerized information display and search program. It's potential for more general use in consumer information processing research is quite high.

Future Research Directions

The conceptual framework underlying this dissertation is well-suited to programmatic research into the effects of consumer product class knowledge. We expect that the study examining the role of inter-attribute correlation will be run in the near future. First, this will serve as a more complete test of the conceptual framework underlying the dissertation, since it includes manipulations of two background factors. Second, the study will test a general mechanism for how inter-attribute correlations affect search, evaluation and choice. Finally, it should give important insights into consumers' use of a price-quality association which may be used across product classes, as also the use of correlation between technically-complex attributes specific to a product class. The results of this study should also identify areas for future research on how various elements of our product class knowledge taxonomy interact to influence search, evaluation and choice (Brucks and Chakravarti 1987).

The role of range knowledge can also be studied further. One interesting extension will be to examine whether consumers who lack range information do in fact avoid extreme evaluations, or whether their uncertainty also leads to increased variability of evaluations, which might in part account for the observed pattern of results. Brief written statements were furnished by subjects in the search task of the range study, and these can be examined in order to better understand the actual process. One interesting aspect is whether or not consumers naturally assign "default" range values when they lack prior range knowledge.

In the present study, no significant differences were found between subjects given the wide range and the narrow range on the manipulated attribute. A similar study can be conducted to examine contextual differences further, using other levels of the known range. For example, the wide range can be manipulated to be a different multiple of the narrow range, say, three times as wide. This will lead to a more complete understanding of the effects of range knowledge in evaluation and search.

In the longer term, the program of research will be extended to examine how consumers use knowledge of summary brand evaluations and summary attribute importance. Another important aspect that needs to be examined by future research is how differences in the organization of a type of product class knowledge can moderate its use. Finally, as discussed previously, an improved understanding of the role of the various elements of product class knowledge will provide the basis for studying the contrasting and complementary effects that may occur when consumers bring different types of knowledge to bear simultaneously on a decision problem.

APPENDIX 1 - WIDE RANGE CONDITION INSTRUCTIONS AND QUESTIONNAIRE

WR1

INTRODUCTION TO STUDY

You have been asked by a friend overseas to buy and mail him (her) a Single Lens Reflex (SLR) camera which uses 35 mm roll film. In order to guide your purchase, he (she) has indicated that four features of SLR cameras are equally important to him (her). These four features are:

(1) MAXIMUM SHUTTER SPEED:

An SLR camera's maximum shutter speed is measured by an index of the number of exposures per second possible under laboratory conditions. The higher this index number, the better the camera.

A recent article in AMATEUR PHOTOGRAPHY (AP) magazine has indicated that SLR cameras available on the market have maximum shutter speed index numbers ranging from

LOW	HIGH
1000	1800

(2) PRICE:

This refers to the retailer's advertised price for the camera and is the price you would actually pay.

AP magazine carries retailers' advertised prices. Your examination of these prices shows that the SLR cameras advertised range in price from

LOW	HIGH
200	400

(3) WARRANTY PERIOD:

This refers to the number of months from date of purchase for which the manufacturer warranties parts and labor.

The advertised warranties in AP magazine for the SLR cameras available range from

LOW	HIGH
6	12

(4) LENS QUALITY:

An SLR camera's lens quality is measured by an index of how sensitive the lens is and the sharpness of the pictures. The higher this index number, the better the camera.

The AP magazine article has indicated that SLR cameras available on the market have lens quality index numbers ranging from

LOW	HIGH
25	55

Your friend trusts your judgement about price. He (she) would like you to weight the four features equally in making the purchase.

WR2

PART A: 1

Please keep in mind that you are buying a camera for your friend, and all four features are equally important to him (her).

You are now in a camera store looking for a camera for your friend. The salesperson tells you that the store has three SLR cameras in stock (brands A, B and C). All the brands cost $350. The salesperson also tells you that the lens quality index for brand B is 55. You are interested in buying the camera that you believe will best satisfy your friend.

(1) At this point, you have to decide what is the next piece of information you will ask the salesperson for. Please think about this and indicate your response by checking the appropriate cell in the matrix given below. You are permitted to check only one cell.

	Brands		
	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

WR3

PART A: 2

(2) Given the information you have acquired so far, what is the next item of information you would look for? Please indicate your response by checking the appropriate cell in the matrix given below. Do not repeat information you have already acquired.

	Brands		
	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

____

____

____

____

____

____

WR4

PART B:

Please review the introduction to the study (i.e. the first sheet). You are now shown a camera that has the following features:

Max. Shutter Speed Index: 1600

Price: $325

Warranty: 9 months

Lens Quality Index: 55

Please answer the following questions about the camera described above.

1. Using the scale given below, how desirable will this camera be for your friend? (Circle the appropriate number)

Extremely Undesirable 1 2 3 4 5 6 7 8 9 Extremely Desirable

2. How confident are you of the desirability rating you provided above? (Circle the appropriate number)

Not at all Confident 1 2 3 4 5 6 7 8 9 Extremely Confident

PART C:

We would now like to ask you some questions about the task you just did. Please read each question carefully and then mark the response that you believe best represents your response to the question.

1. Please rate how realistic you found these aspects of the study:

(a) Making a purchase based on descriptions given on paper

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(b) The brand for which you were asked to give a desirability rating

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(c) The range of values available on Maximum Shutter Speed

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(d) The range of values available on Price

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(e) The range of values available on Warranty

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(f) The range of values available on Lens Quality Index

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

2. Please rate how reliable you think the given information was about

(a) The range of values available on Maximum Shutter Speed

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(b) The range of values available on Price

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(c) The range of values available on Warranty

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(d) The range of values available on Lens Quality Index

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

3. Do you own a camera? Yes / No

If yes, what brand is it? ________________

what type is it? SLR / Instant / Fixed Focus

4. Relative to the average camera buyer, how would you rate your understanding of the following terms:

(a) Maximum Shutter Speed

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(b) Price

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(c) Warranty

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(d) Lens Quality Index

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

5. How useful was the information given to you in helping you evaluate the desirability of the camera described in Part B of the study?

Not at all useful 1 2 3 4 5 6 7 8 9 Very useful

6. Specifically, how useful was the information given to you about the range of features in helping you evaluate the desirability of the camera?

Not at all useful 1 2 3 4 5 6 7 8 9 Very useful

If you checked (5) or more on the scale above, please describe briefly how you used the range information in evaluating the desirability of the camera.

____

____

____

____

____

WR7

7. To what extent do you think SLR camera brands differ on these features:

(a) Maximum Shutter Speed

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(b) Price

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(c) Warranty

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(d) Lens Quality Index

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

We would now like to ask you for some personal information for classification purposes.

(a) Age ________

(b) Sex M / F

(c) Occupation

Full-time student ________

Part-time student ________

Other ________

Thank you for your cooperation.

APPENDIX 2 - NARROW RANGE CONDITION INSTRUCTIONS AND QUESTIONNAIRE

NR1

INTRODUCTION TO STUDY

You have been asked by a friend overseas to buy and mail him (her) a Single Lens Reflex (SLR) camera which uses 35 mm roll film. In order to guide your purchase, he (she) has indicated that four features of SLR cameras are equally important to him (her). These four features are:

(1) MAXIMUM SHUTTER SPEED:

An SLR camera's maximum shutter speed is measured by an index of the number of exposures per second possible under laboratory conditions. The higher this index number, the better the camera.

A recent article in AMATEUR PHOTOGRAPHY (AP) magazine has indicated that SLR cameras available on the market have maximum shutter speed index numbers ranging from

LOW	HIGH
1000	1800

(2) PRICE:

This refers to the retailer's advertised price for the camera and is the price you would actually pay.

AP magazine carries retailers' advertised prices. Your examination of these prices shows that the SLR cameras advertised range in price from

LOW	HIGH
200	400

(3) WARRANTY PERIOD:

This refers to the number of months from date of purchase for which the manufacturer warranties parts and labor.

The advertised warranties in AP magazine for the SLR cameras available range from

LOW	HIGH
6	12

(4) LENS QUALITY:

An SLR camera's lens quality is measured by an index of how sensitive the lens is and the sharpness of the pictures. The higher this index number, the better the camera.

The AP magazine article has indicated that SLR cameras available on the market have lens quality index numbers ranging from

LOW	HIGH
30	50

Your friend trusts your judgement about price. He (she) would like you to weight the four features equally in making the purchase.

NR2

PART A: 1

Please keep in mind that you are buying a camera for your friend, and all four features are equally important to him (her).

You are now in a camera store looking for a camera for your friend. The salesperson tells you that the store has three SLR cameras in stock (brands A, B and C). All the brands cost $350. The salesperson also tells you that the lens quality index for brand B is 55. You are interested in buying the camera that you believe will best satisfy your friend.

(1) At this point, you have to decide what is the next piece of information you will ask the salesperson for. Please think about this and indicate your response by checking the appropriate cell in the matrix given below. You are permitted to check only one cell.

Brands

	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

NR3

PART A: 2

(2) Given the information you have acquired so far, what is the next item of information you would look for? Please indicate your response by checking the appropriate cell in the matrix given below. Do not repeat information you have already acquired.

Brands

	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

____

____

____

____

____

____

NR4

PART B:

Please review the introduction to the study (i.e. the first sheet). You are now shown a camera that has the following features:

Max. Shutter Speed Index: 1600

Price: $325

Warranty: 9 months

Lens Quality Index: 55

Please answer the following questions about the camera described above.

1. Using the scale given below, how desirable will this camera be for your friend? (Circle the appropriate number)

Extremely Undesirable 1 2 3 4 5 6 7 8 9 Extremely Desirable

2. How confident are you of the desirability rating you provided above? (Circle the appropriate number)

Not at all Confident 1 2 3 4 5 6 7 8 9 Extremely Confident

PART C:

We would now like to ask you some questions about the task you just did. Please read each question carefully and then mark the response that you believe best represents your response to the question.

1. Please rate how realistic you found these aspects of the study:

(a) Making a purchase based on descriptions given on paper

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(b) The brand for which you were asked to give a desirability rating

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(c) The range of values available on Maximum Shutter Speed

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(d) The range of values available on Price

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(e) The range of values available on Warranty

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(f) The range of values available on Lens Quality Index

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

2. Please rate how reliable you think the given information was about

(a) The range of values available on Maximum Shutter Speed

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(b) The range of values available on Price

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(c) The range of values available on Warranty

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

(d) The range of values available on Lens Quality Index

Quite Unreliable 1 2 3 4 5 6 7 8 9 Quite Reliable

NR6

3. Do you own a camera? Yes / No

If yes, what brand is it? ______________

what type is it? SLR / Instant / Fixed Focus

4. Relative to the average camera buyer, how would you rate your understanding of the following terms:

(a) Maximum Shutter Speed

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(b) Price

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(c) Warranty

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(d) Lens Quality Index

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

5. How useful was the information given to you in helping you evaluate the desirability of the camera described in Part B of the study?

Not at all useful 1 2 3 4 5 6 7 8 9 Very useful

6. Specifically, how useful was the information given to you about the range of features in helping you evaluate the desirability of the camera?

Not at all useful 1 2 3 4 5 6 7 8 9 Very useful

If you checked (5) or more on the scale above, please describe briefly how you used the range information in evaluating the desirability of the camera.

____

____

____

____

____

NR7

7. To what extent do you think SLR camera brands differ on these features:

(a) Maximum Shutter Speed

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(b) Price

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(c) Warranty

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(d) Lens Quality Index

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

We would now like to ask you for some personal information for classification purposes.

(a) Age ________

(b) Sex M / F

(c) Occupation

Full-time student ________

Part-time student ________

Other ________

Thank you for your cooperation.

APPENDIX 3 - NO-RANGE CONDITION INSTRUCTIONS AND QUESTIONNAIRE

INTRODUCTION TO STUDY

You have been asked by a friend overseas to buy and mail him (her) a Single Lens Reflex (SLR) camera which uses 35 mm roll film. In order to guide your purchase, he (she) has indicated that four features of SLR cameras are equally important to him (her). These four features are:

(1) MAXIMUM SHUTTER SPEED:

An SLR camera's maximum shutter speed is measured by an index of the number of exposures per second possible under laboratory conditions. The higher this index number, the better the camera.

(2) PRICE:

This refers to the retailer's advertised price for the camera and is the price you would actually pay.

(3) WARRANTY PERIOD:

This refers to the number of months from date of purchase for which the manufacturer warranties parts and labor.

(4) LENS QUALITY:

An SLR camera's lens quality is measured by an index of how sensitive the lens is and the sharpness of the pictures. The higher this index number, the better the camera.

Your friend trusts your judgement about price. He (she) would like you to weight the four features equally in making the purchase.

OR2

PART A: 1

Please keep in mind that you are buying a camera for your friend, and all four features are equally important to him (her).

You are now in a camera store looking for a camera for your friend. The salesperson tells you that the store has three SLR cameras in stock (brands A, B and C). All the brands cost $350. The salesperson also tells you that the lens quality index for brand B is 55. You are interested in buying the camera that you believe will best satisfy your friend.

(1) At this point, you have to decide what is the next piece of information you will ask the salesperson for. Please think about this and indicate your response by checking the appropriate cell in the matrix given below. You are permitted to check only one cell.

	Brands		
	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

____

____

____

____

____

____

OR3

PART A: 2

(2) Given the information you have acquired so far, what is the next item of information you would look for? Please indicate your response by checking the appropriate cell in the matrix given below. Do not repeat information you have already acquired.

	Brands		
	A	B	C
Max. Shutter Speed			
Lens Quality		55	
Warranty			

Please describe how you will use this piece of information that you just requested.

OR4

PART B:

Please review the introduction to the study (i.e. the first sheet). You are now shown a camera that has the following features:

Max. Shutter Speed Index:	1600
Price:	$325
Warranty:	9 months
Lens Quality Index:	55

Please answer the following questions about the camera described above.

1. Using the scale given below, how desirable will this camera be for your friend? (Circle the appropriate number)

Extremely Undesirable	1	2	3	4	5	6	7	8	9	Extremely Desirable

2. How confident are you of the desirability rating you provided above? (Circle the appropriate number)

Not at all Confident	1	2	3	4	5	6	7	8	9	Extremely Confident

OR5

PART C:

We would now like to ask you some questions about the task you just did. Please read each question carefully and then mark the response that you believe best represents your response to the question.

1. Please rate how realistic you found these aspects of the study:

(a) Making a purchase based on descriptions given on paper

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(b) The brand for which you were asked to give a desirability rating

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

2. Do you own a camera? Yes / No

If yes, what brand is it? ________________

what type is it? SLR / Instant / Fixed Focus

3. Relative to the average camera buyer, how would you rate your understanding of the following terms:

(a) Maximum Shutter Speed

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(b) Price

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(c) Warranty

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

(d) Lens Quality Index

Much Worse 1 2 3 4 5 6 7 8 9 Much Better

4. How useful was the information given to you in helping you evaluate the desirability of the camera described in Part B of the study?

Not at all useful 1 2 3 4 5 6 7 8 9 Very useful

5. To what extent do you think SLR camera brands differ on these features:

(a) Maximum Shutter Speed

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(b) Price

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(c) Warranty

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

(d) Lens Quality Index

Brands do not differ much	1	2	3	4	5	6	7	8	9	Brands differ a lot

We would now like to ask you for some personal information for classification purposes.

(a) Age ________

(b) Sex M / F

(c) Occupation

Full-time student ________

Part-time student ________

Other ________

Thank you for your cooperation.

APPENDIX 4 - RANGE STUDY: SEARCH TASK CODING

Search Task Coding:

For coding the search patterns, the cells of the search task matrix were numbered from 1 to 9 as shown below. The "seed" brand-attribute value for Brand B was in cell 5 for all subjects.

Pure brand-based search (BB) patterns were:

5 -> 2 -> 8 and 5 -> 8 -> 2

Pure attribute-based search (AA) patterns were:

5 -> 4 -> 6 and 5 -> 6 -> 4

All other patterns were classified as "Other".

	A	B	C
Max. Shutter Speed Index	1	2	3
Lens Quality Index	4	5 55	6
Warranty Period	7	8	9

APPENDIX 5 - TASK INSTRUCTIONS AND MANIPULATIONS FOR CORRELATION STUDY

TASK INSTRUCTIONS AND MANIPULATIONS FOR CORRELATION STUDY

A: THE CORRELATION MANIPULATION.

A.1 Instruction for the High Correlation Condition.

High Fidelity magazine recently commissioned a study which examined some common beliefs that people have about stereo receivers. Thus, many people believe that higher priced stereo receivers usually have longer warranties. Also, many people believe that a stereo receiver's distortion is negatively related to its power. Thus, people believe that receivers with low percentage distortion are usually the ones that have high power output in watts.

The highly respected stereo experts who conducted the High Fidelity magazine study reported that both these commonly held beliefs are true. First, they found that higher priced stereos do indeed have significantly longer manufacturer's warranties than lower priced receivers.

Moreover, in extensive technical tests, these experts also confirmed that the distortion level of a receiver is negatively related to its power output. Because there is a reserve of power available, brief "spikes" in loudness can be handled without the sound being distorted. Conversely, receivers with low power output tend to have high percentage distortion. Since there is no reserve power available, spikes in loudness tend to distort the sound.

The study did not reveal any other significant relationships between the dimensions that people use to evaluate stereo receivers.

Please review the above information and inform the monitor when you are ready to proceed.

A.2 Instructions for the No Correlation Condition.

High Fidelity magazine recently commissioned a study which examined some common beliefs that people have about stereo receivers. Thus, many people believe that higher priced stereo receivers usually have longer warranties. Also, many people believe that a stereo receiver's distortion is negatively related to its power. Thus, people believe that receivers with low percentage distortion are usually the ones that have high power output in watts.

The highly respected stereo experts who conducted the High Fidelity magazine study reported that both these commonly held beliefs are not true. First, they found that there was no clear relationship between stereo prices and lengths of warranty. Both prices and warranties were set by manufacturers based on sales and profit expectations. Consequently, one is just as likely to find longer or shorter warranties in high and low priced stereo receivers.

Moreover, in extensive technical tests, these experts also found that contrary to popular belief, there is no apparent relationship between the distortion level of a receiver and its power output. Advances in circuit design and amplifier electronics have apparently made it possible for even low power stereo receivers to amplify brief bursts of loud sound without significant distortion. Thus, one is just as likely to find high or low distortion levels in high or low power stereo receivers.

The study did not reveal any other significant relationships between the dimensions that people use to evaluate stereo receivers.

Please review the above information and inform the monitor when you are ready to proceed.

B: THE INVOLVEMENT MANIPULATION.

B.1 Task Instructions for the High Involvement Condition: (Para 1-5)

We would now like for you to imagine that you are going to purchase a stereo receiver as a gift for a favorite relative for his/her birthday. You have set yourself a budget of $400 within which you will buy this receiver.

Since you would like to buy this favorite relative a receiver that they would really like, you have asked him/her what receiver dimensions (s)he thinks are important. In response, your relative told you that (s)he believes that all six features of stereo receivers should receive equal importance in the purchase.

In its memory, the computer has information about 15 brands of stereo receivers (identified by the letters A-O). The information concerns the six features (price, warranty, distortion, power, frequency response and signal to noise ratio). This information can be obtained, one item at a time, using the computer keyboard. Instructions on how to use the keyboard will be given once you start.

Using the computer to acquire information on these stereo receivers, please choose the best brand, keeping in mind that the six features should be given equal importance in buying the gift. Feel free to use any information that was given to you in the study that you feel will help your decision.

Also, please note that you may examine any given item of information as often as you like on the computer screen, but you are not permitted to write this down.

B.2 Task Instructions for the Low Involvement Condition

We would now like you to imagine that you are accompanying a casual friend on a shopping trip. Your friend has to purchase a stereo receiver as a birthday gift for a relative and has asked you to help in the purchase. Your friend has set a budget of $400 within which s(he) will buy this receiver.

Your friend tells you that his/her relative has indicated that all six features of the stereo receiver should receive equal importance in the purchase.

In its memory, the computer has information about 15 brands of stereo receivers (identified by the letters A-O). The information concerns the six features (price, warranty, distortion, power, frequency response and signal to noise ratio). This information can be obtained, one item at a time, using the computer keyboard. Instructions on how to use the keyboard will be given once you start.

Using the computer to acquire information on these stereo receivers, please choose the best brand, keeping in mind that the six features should be given equal importance in buying the gift. Feel free to use any information that was given to you in the study that you feel will help your decision.

Also, please note that you may examine any given item of information as often as you like on the computer screen, but you are not permitted to write this down.

C: THE TIME PRESSURE MANIPULATION.

C.1 Task Instructions for the High Time Pressure Condition (To be administered verbally)

Since the computers in this laboratory are heavily scheduled, we would like you to take no longer than 10 minutes to make your choice. We will pay you a bonus of $1 at the end of the study if you can meet this time constraint and also pick one of the eight better brands that are available.

We would like to make sure that the computer record is accurate before you leave. Please wait briefly while the record is verified.

Thanks.

C.2 Task Instructions for the Low Time Pressure Condition (To be administered verbally)

You may proceed at your own pace, but in any case it should not take longer than 60 minutes for you to make your choice. We will pay you a bonus of $1 if you can finish within this time and also pick one of the eight better brands that are available.

We would like to make sure that the computer record is accurate before you leave. Please wait briefly while the record is verified.

Thanks.

APPENDIX 6 - INFORMED CONSENT FORM FOR CORRELATION STUDY

Informed Consent Form

This research study is concerned with examining how consumers use product information that is made available in a computer data base. You will be asked to make some product choices in a simulated gift-giving context. Thereafter, you will be asked some questions about what you did. Your identity will not be reported in any of the results of the study.

The study will involve no discomfort to you and you will not be exposed to any risk. You will be paid for your one-time participation in the study a sum of $3.00. Also, depending on whether or not you can meet some specific study requirements, you may be able to earn an additional bonus of $1. If you have any questions at all at the end of the study, the experimenter will be glad to answer them. Thus, you may gain from an increased understanding of consumer behavior.

Note that you are free to withdraw your consent at any time during the session without any prejudice to you. The payment will of-course be made only upon completing the study. According to regulations set down by the University, it is necessary for us to have you read the following statement and indicate your consent by signing below:

> "I have read and understood the procedures above.
> I agree to participate in the procedure and I have received a copy of this description."

Subject

Witness

Principal Investigator's Name and Address

APPENDIX 7 - ORIENTING INSTRUCTIONS FOR CORRELATION STUDY

INTRODUCTION TO TASK

This study is concerned with the product category of stereo receivers. When buying stereo receivers, most people consider a few key characteristics of stereo receivers. These basic characteristics are briefly described below. Please read these descriptions carefully.

1. Price:

This is the price stated in dollars that you would actually pay for the stereo receiver at a retail outlet.

2. Warranty:

This is the number of months from date of purchase for which the manufacturer provides a comprehensive warranty on parts and labor.

3. Distortion:

This is a measure of amplifier accuracy. It indicates whether the amplifier is internally generating "harmonics" (i.e. multiples of the original frequencies) that affect sound quality adversely. Distortion is indicated as a percentage. The lower the percentage distortion score, the better the stereo. For example, other things being equal, a stereo with .01% distortion is better than one with .05% distortion.

4. Power:

This is a measure of the amount of work the receiver's amplifier can do, with both channels being driven. Power is measured in watts.

A stereo that delivers more power is more desirable. For example, other things being equal, a stereo with power output of 60 watts is better than one delivering 20 watts.

5. Frequency Response:

Design and component imperfections can result in non-uniform amplification of different frequencies. This non-uniformity lowers sound quality. Uniformity of frequency response is measured by an index. Higher index values indicate greater uniformity of frequency response and are more desirable. For example, other things being equal, a stereo with frequency response of 40 is better than one with frequency response of 20.

6. Signal to Noise Ratio:

This measures how much extraneous noise a receiver's phono stage generates. It is measured by an index. Higher values of signal to noise ratio index are more desirable. For example, other things being equal, a stereo with signal to noise ratio of 30 is better than one with a ratio of 10.

Please review these instructions to ensure that you have understood them. If you have any questions, please ask the research monitor. Otherwise, please tell the research monitor that you are ready to continue.

APPENDIX 8 - SAMPLE RUN FOR CORRELATION STUDY

```
PLEASE INPUT SUBJECT #? 101
```

```
WELCOME! WE APPRECIATE YOUR PARTICIPATING IN THIS CONSUMER BEHAVIOR
STUDY. WE ARE INTERESTED IN DETERMINING WHAT KIND OF INFORMATION
CONSUMERS LIKE YOURSELF FIND USEFUL IN A VARIETY OF PRODUCT CHOICE
SITUATIONS.

YOU WILL BE WORKING WITH A COMPUTER THAT HAS DIFFERENT KINDS OF PRODUCT
INFORMATION STORED IN ITS MEMORY.

IN THE FIRST PHASE OF THE EXPERIMENT, YOU WILL BE GIVEN IMPORTANT
INSTRUCTIONS ON HOW TO USE THE KEYBOARD TO ACQUIRE THIS INFORMATION.
THEN YOU WILL DO A PRACTICE TASK TO FAMILIARIZE YOU WITH THE EQUIPMENT
AND THE STUDY PROCEDURES.

FOLLOWING THE PRACTICE TASK, YOU WILL PARTICIPATE IN THE MAIN STUDY.

FINALLY, YOU WILL BE ASKED TO FILL OUT A QUESTIONNAIRE ABOUT THE STUDY.
======================================================================




Press any key to continue .....
```

```
INSTRUCTIONS FOR USING THE KEYBOARD:

THE SCREEN WILL CONTINUOUSLY DISPLAY THE LETTERS A-O WHICH IDENTIFY
BRANDS, AND A LIST OF SIX ATTRIBUTES. EACH ATTRIBUTE IS ASSIGNED A
NUMBER, FOR EASE OF TYPING.

YOU CAN OBTAIN INFORMATION ABOUT THE BRANDS ON THOSE ATTRIBUTES BY
SPECIFYING THE ITEM YOU WANT TO SEE.

FOR EACH ITEM THAT YOU WANT, PLEASE TYPE
EITHER              A BRAND, FOLLOWED BY AN ATTRIBUTE
OR                  AN ATTRIBUTE, FOLLOWED BY A BRAND.

IF YOU TYPE IN A LETTER FIRST, THE NEXT INPUT MUST BE A NUMBER,
DENOTING THE ATTRIBUTE YOU WANT TO EXAMINE. SIMILARLY, IF YOU TYPE IN
A NUMBER FIRST, THE NEXT INPUT MUST BE A LETTER, DENOTING THE BRAND.

IF YOU MAKE A MISTAKE, THE PROGRAM WILL PROMPT YOU TO TYPE IN THE
INPUTS CORRECTLY.
======================================================================


Press any key to continue .....
```

```
YOU MAY REQUEST ANY ITEM OF INFORMATION AS OFTEN AS YOU PLEASE ON THE
COMPUTER SCREEN. HOWEVER, PLEASE DO NOT TAKE NOTES ON SEPARATE SHEETS
OF PAPER.

FOR LETTERS, YOU MAY USE UPPER OR LOWER CASE.
FOR NUMBERS, PLEASE USE THE KEYS AT THE TOP OF THE KEYBOARD.
======================================================================









Press any key to continue .....
```

```
YOU ARE NOW GOING TO DO THE PRACTICE TASK. THIS IS INTENDED TO
FAMILIARIZE YOU WITH USING THE KEYBOARD AND THE STUDY PROCEDURES.

WE WOULD LIKE YOU TO IMAGINE THAT YOU WANT TO BUY A POCKET CALCULATOR.
INFORMATION ON 15 BRANDS (A-O) AND ON 6 ATTRIBUTES (TO BE LISTED)
IS STORED IN THE COMPUTER.

PLEASE USE THE KEYBOARD TO OBTAIN INFORMATION ABOUT THE CALCULATORS.
YOU MAY STOP WHEN YOU FEEL COMFORTABLE WITH USING THE KEYBOARD.
======================================================================









Press any key to continue .....
```

```
=====================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE                ($)        =  1
         WARRANTY             (MONTHS)   =  2
         BATTERY LIFE         (HOURS)    =  3
         WEIGHT               (OZS.)     =  4
         MATH KEYS            (#)        =  5
         FINANCIAL KEYS       (#)        =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
=====================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)?
```

```
===================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              ($)        =  1
         WARRANTY           (MONTHS)   =  2
         BATTERY LIFE       (HOURS)    =  3
         WEIGHT             (OZS.)     =  4
         MATH KEYS          (#)        =  5
         FINANCIAL KEYS     (#)        =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
====================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)1
 NOW PLEASE GIVE THE BRAND CODE ( A - O) ?a

FOR BRAND A    PRICE IS  15



Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE                  ($)         =  1
         WARRANTY               (MONTHS)    =  2
         BATTERY LIFE           (HOURS)     =  3
         WEIGHT                 (OZS.)      =  4
         MATH KEYS              (#)         =  5
         FINANCIAL KEYS         (#)         =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)2
 NOW PLEASE GIVE THE BRAND CODE ( A - O) ?a

FOR BRAND A   WARRANTY IS  3



Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              ($)       =  1
         WARRANTY           (MONTHS)  =  2
         BATTERY LIFE       (HOURS)   =  3
         WEIGHT             (OZS.)    =  4
         MATH KEYS          (#)       =  5
         FINANCIAL KEYS     (#)       =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)f
 NOW PLEASE GIVE THE ATTRIBUTE NUMBER ( 1 - 6) ?9

 YOU HAVE MADE AN ERROR
   YOU PRESSED  9
 REMEMBER, FOR ATTRIBUTES, PRESS 1 - 6
           FOR BRANDS    , PRESS A - O

Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              ($)        =  1
         WARRANTY           (MONTHS)   =  2
         BATTERY LIFE       (HOURS)    =  3
         WEIGHT             (OZS.)     =  4
         MATH KEYS          (#)        =  5
         FINANCIAL KEYS     (#)        =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)f
 NOW PLEASE GIVE THE ATTRIBUTE NUMBER ( 1 - 6) ?3

FOR BRAND F   BATTERY LIFE IS  12




Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              ($)        =  1
         WARRANTY           (MONTHS)   =  2
         BATTERY LIFE       (HOURS)    =  3
         WEIGHT             (OZS.)     =  4
         MATH KEYS          (#)        =  5
         FINANCIAL KEYS     (#)        =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)&
 You have pressed the END SEARCH key (&).

 Please confirm that you want to END SEARCH by pressing
         the   &   key again. Thanks.
```

```
WELCOME TO THE MAIN STUDY. BEFORE YOU BEGIN, WE WOULD LIKE YOU TO
CAREFULLY READ THE FOLLOWING INSTRUCTIONS.

THIS STUDY IS CONCERNED WITH THE PRODUCT CATEGORY OF STEREO RECEIVERS.
WHEN BUYING STEREO RECEIVERS, MOST PEOPLE CONSIDER A FEW KEY
CHARACTERISTICS OF STEREO RECEIVERS. THESE BASIC CHARACTERISTICS ARE
BRIEFLY DESCRIBED BELOW. PLEASE READ THESE DESCRIPTIONS CAREFULLY.

1. PRICE:
THIS IS THE PRICE STATED IN DOLLARS THAT YOU WOULD ACTUALLY PAY FOR
THE STEREO RECEIVER AT A RETAIL OUTLET.

2. WARRANTY:
THIS IS THE NUMBER OF MONTHS FROM DATE OF PURCHASE FOR WHICH THE
MANUFACTURER PROVIDES A COMPREHENSIVE WARRANTY ON PARTS AND LABOR.

======================================================================




Press any key to continue .....
```

```
3. DISTORTION:

THIS IS A MEASURE OF AMPLIFIER ACCURACY. IT INDICATES WHETHER THE
AMPLIFIER IS INTERNALLY GENERATING HARMONICS (I.E. MULTIPLES OF THE
ORIGINAL FREQUENCIES) THAT AFFECT SOUND QUALITY ADVERSELY. DISTORTION
IS INDICATED AS A PERCENTAGE. THE LOWER THE PERCENTAGE DISTORTION
SCORE, THE BETTER THE STEREO. FOR EXAMPLE, OTHER THINGS BEING EQUAL, A
STEREO WITH .01% DISTORTION IS BETTER THAN ONE WITH .05% DISTORTION.

4. POWER:

THIS IS A MEASURE OF THE AMOUNT OF WORK THE RECEIVER'S AMPLIFIER CAN DO
WITH BOTH CHANNELS BEING DRIVEN. POWER IS MEASURED IN WATTS. A STEREO
THAT DELIVERS MORE POWER IS MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS
BEING EQUAL, A STEREO WITH POWER OUTPUT OF 60 WATTS IS BETTER THAN ONE
DELIVERING 20 WATTS.
======================================================================




Press any key to continue .....
```

```
5. FREQUENCY RESPONSE:

DESIGN AND COMPONENT IMPERFECTIONS CAN RESULT IN NON-UNIFORM
AMPLIFICATION OF DIFFERENT FREQUENCIES. THIS NON-UNIFORMITY LOWERS
SOUND QUALITY. UNIFORMITY OF FREQUENCY RESPOSE IS MEASURED BY AN
INDEX. HIGHER INDEX VALUES INDICATE GREATER UNIFORMITY OF FREQUENCY
RESPONSE AND ARE MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS BEING
EQUAL, A STEREO WITH FREQUENCY RESPONSE OF 40 IS BETTER THAN ONE WITH
FREQUENCY RESPONSE OF 20.

6. SIGNAL TO NOISE RATIO:

THIS MEASURES HOW MUCH EXTRANEOUS NOISE A RECEIVER'S PHONO STAGE
GENERATES. IT IS MEASURED BY AN INDEX. HIGHER VALUES OF SIGNAL TO
NOISE RATIO INDEX ARE MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS BEING
EQUAL, A STEREO WITH SIGNAL TO NOISE RATIO OF 30 IS BETTER THAN ONE
WITH A RATIO OF 10.

PLEASE REVIEW THESE INSTRUCTIONS TO ENSURE THAT YOU HAVE UNDERSTOOD
THEM. IF YOU HAVE ANY QUESTIONS PLEASE ASK THE RESEARCH MONITOR.
OTHERWISE, PLEASE TELL THE RESEARCH MONITOR THAT YOU ARE READY TO
CONTINUE.
======================================================================
Press any key to continue .....
```

```
HIGH FIDELITY MAGAZINE RECENTLY COMMISSIONED A STUDY WHICH EXAMINED
SOME COMMON BELIEFS THAT PEOPLE HAVE ABOUT STEREO RECEIVERS. THUS,
MANY PEOPLE BELIEVE THAT HIGHER PRICED STEREO RECEIVERS USUALLY HAVE
LONGER WARRANTIES. ALSO, MANY PEOPLE BELIEVE THAT A STEREO
RECEIVER'S DISTORTION IS NEGATIVELY RELATED TO ITS POWER. THUS, PEOPLE
BELIEVE THAT RECEIVERS WITH LOW PERCENTAGE DISTORTION ARE USUALLY THE
ONES THAT HAVE HIGH POWER OUTPUT IN WATTS.
=======================================================================








Press any key to continue .....
```

```
THE HIGHLY RESPECTED STEREO EXPERTS WHO CONDUCTED THE HIGH FIDELITY
MAGAZINE STUDY REPORTED THAT BOTH THESE COMMONLY HELD BELIEFS ARE
TRUE. FIRST, THEY FOUND THAT HIGHER PRICED STEREOS DO INDEED HAVE
SIGNIFICANTLY LONGER MANUFACTURER'S WARRANTIES THAN LOWER PRICED
RECEIVERS.

MOREOVER, IN EXTENSIVE TECHNICAL TESTS, THESE EXPERTS ALSO CONFIRMED
THAT THE DISTORTION LEVEL OF A RECEIVER IS NEGATIVELY RELATED TO ITS
POWER OUTPUT. BECAUSE THERE IS A RESERVE OF POWER AVAILABLE, BRIEF
SPIKES IN LOUDNESS CAN BE HANDLED WITHOUT THE SOUND BEING DISTORTED.

CONVERSELY, RECEIVERS WITH LOW POWER OUTPUT TEND TO HAVE HIGH
PERCENTAGE DISTORTION. SINCE THERE IS NO RESERVE POWER AVAILABLE,
SPIKES IN LOUDNESS TEND TO DISTORT THE SOUND.

THE STUDY DID NOT REVEAL ANY OTHER SIGNIFICANT RELATIONSHIPS BETWEEN
THE DIMENSIONS THAT PEOPLE USE TO EVALUATE STEREO RECEIVERS.

PLEASE REVIEW THE ABOVE INFORMATION AND INFORM THE MONITOR WHEN YOU
ARE READY TO PROCEED.
=====================================================================


Press any key to continue .....
```

```
WE WOULD NOW LIKE YOU TO IMAGINE THAT YOU ARE GOING TO PURCHASE A
STEREO RECEIVER AS A GIFT FOR A FAVORITE RELATIVE FOR HIS/HER
BIRTHDAY. YOU HAVE SET YOURSELF A BUDGET OF $400 WITHIN WHICH YOU WILL
BUY THIS RECEIVER.

SINCE YOU WOULD LIKE TO BUY THIS FAVORITE RELATIVE A RECEIVER THAT THEY
WOULD REALLY LIKE, YOU HAVE ASKED HIM/HER WHAT RECEIVER DIMENSIONS
S(HE) THINKS ARE IMPORTANT. IN RESPONSE, YOUR RELATIVE TOLD YOU THAT
S(HE) BELIEVES THAT ALL SIX FEATURES OF STEREO RECEIVERS SHOULD
RECEIVE EQUAL IMPORTANCE IN THE PURCHASE.
======================================================================









Press any key to continue .....
```

```
IN ITS MEMORY, THE COMPUTER HAS INFORMATION ABOUT 15 BRANDS OF STEREO
RECEIVERS (IDENTIFIED BY THE LETTERS A-O). THE INFORMATION CONCERNS
THE SIX FEATURES (PRICE, WARRANTY, DISTORTION, POWER, FREQUENCY
RESPONSE AND SIGNAL TO NOISE RATIO). THIS INFORMATION CAN BE OBTAINED
ONE ITEM AT A TIME, USING THE COMPUTER KEYBOARD. INSTRUCTIONS ON HOW
TO USE THE KEYBOARD WILL BE GIVEN ONCE YOU START.

USING THE COMPUTER TO ACQUIRE INFORMATION ON THESE STEREO RECEIVERS,
PLEASE CHOOSE THE BEST BRAND. KEEPING IN MIND THAT THE SIX FEATURES
SHOULD BE GIVEN EQUAL IMPORATNCE IN BUYING THE GIFT. FEEL FREE TO USE
ANY INFORMATION THAT WAS GIVEN TO YOU IN THE STUDY THAT YOU THINK WILL
HELP YOUR DECISION.

ALSO, PLEASE NOTE THAT YOU MAY EXAMINE ANY GIVEN ITEM OF INFORMATION AS
OFTEN AS YOU LIKE ON THE COMPUTER SCREEN, BUT YOU ARE NOT PERMITTED TO
WRITE THIS DOWN.
=====================================================================



Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE                 ($)        =  1
         WARRANTY              (MONTHS)   =  2
         DISTORTION            (%)        =  3
         POWER                 (WATTS)    =  4
         FREQUENCY RESPONSE    (INDEX)    =  5
         SIGNAL / NOISE        (INDEX)    =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)1
 NOW PLEASE GIVE THE BRAND CODE ( A - O) ?a

FOR BRAND A   PRICE IS  150




Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE                  ($)        =  1
         WARRANTY               (MONTHS)   =  2
         DISTORTION             (%)        =  3
         POWER                  (WATTS)    =  4
         FREQUENCY RESPONSE     (INDEX)    =  5
         SIGNAL / NOISE         (INDEX)    =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
==================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)q


 YOU HAVE MADE AN ERROR
   YOU PRESSED  Q
 REMEMBER, FOR ATTRIBUTES, PRESS 1 - 6
           FOR BRANDS    , PRESS A - O

Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              ($)        =  1
         WARRANTY           (MONTHS)   =  2
         DISTORTION         (%)        =  3
         POWER              (WATTS)    =  4
         FREQUENCY RESPONSE (INDEX)    =  5
         SIGNAL / NOISE     (INDEX)    =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)f
 NOW PLEASE GIVE THE ATTRIBUTE NUMBER ( 1 - 6) ?3

FOR BRAND F   % DISTORTION IS  .02



Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE                  ($)        =  1
         WARRANTY               (MONTHS)   =  2
         DISTORTION             (%)        =  3
         POWER                  (WATTS)    =  4
         FREQUENCY RESPONSE     (INDEX)    =  5
         SIGNAL / NOISE         (INDEX)    =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
==================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)a
 NOW PLEASE GIVE THE ATTRIBUTE NUMBER ( 1 - 6) ?4

FOR BRAND A   POWER IS  20



Press any key to continue .....
```

```
==================================================
FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS

         PRICE              (S)       =  1
         WARRANTY           (MONTHS)  =  2
         DISTORTION         (%)       =  3
         POWER              (WATTS)   =  4
         FREQUENCY RESPONSE (INDEX)   =  5
         SIGNAL / NOISE     (INDEX)   =  6

FOR SEARCHING BRANDS, USE LETTERS  A -  O

   TO STOP SEARCH,  USE  THE  &  KEY.
===================================================
HOW DO YOU WANT TO SEARCH?
 PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)&
 You have pressed the END SEARCH key (&).

 Please confirm that you want to END SEARCH by pressing
         the   &   key again. Thanks.
```

```
THANK YOU.

HAVE A NICE DAY

A>
```

APPENDIX 9 - TASK QUESTIONNAIRE FOR CORRELATION STUDY

TASK QUESTIONNAIRE

This questionnaire is designed to obtain your reactions to the task that you just performed. Please read the questions carefully and mark your response in the space provided. If any question is not clear, please ask the research monitor.

A. Based on the information that you obtained from the computer, which brand of stereo would make the best gift purchase?

Brand ______

B. Please answer the following questions by making your response on the scale provided.

1. How confident are you that the stereo receiver which you chose as the birthday gift was the best out of the brands available?

Not Confident at all 1 2 3 4 5 6 7 8 9 Quite Confident

2a Please indicate below how desirable you thought each of these brands were as the gift.

	Very Undesirable								Very Desirable	Don't Know
Brand D	1	2	3	4	5	6	7	8	9	0
Brand E	1	2	3	4	5	6	7	8	9	0
Brand F	1	2	3	4	5	6	7	8	9	0
Brand G	1	2	3	4	5	6	7	8	9	0
Brand I	1	2	3	4	5	6	7	8	9	0
Brand J	1	2	3	4	5	6	7	8	9	0
Brand K	1	2	3	4	5	6	7	8	9	0
Brand L	1	2	3	4	5	6	7	8	9	0

2b How confident are you about the accuracy of the desirability judgements that you provided above?

Not Confident at all 1 2 3 4 5 6 7 8 9 Quite Confident

3. How carefully did you make your choice from among the stereo brands?

Not carefully at all	1 2 3 4 5 6 7 8 9	Quite Carefully

4. Please indicate the importance you gave to each of these attributes at the time you were obtaining information and making a choice among the stereo brands.

	Quite Unimportant								Quite Important
Price	1	2	3	4	5	6	7	8	9
Warranty	1	2	3	4	5	6	7	8	9
Distortion	1	2	3	4	5	6	7	8	9
Power	1	2	3	4	5	6	7	8	9
Frequency Response	1	2	3	4	5	6	7	8	9
Signal-to-noise Ratio	1	2	3	4	5	6	7	8	9

5. How sufficient did you find the time that you had to acquire information and make a choice among the stereo receivers?

Quite Insufficient 1 2 3 4 5 6 7 8 9 Quite Sufficient

6. How involved did you feel in the stereo receiver information search and choice task you were engaged in?

Quite Uninvolved 1 2 3 4 5 6 7 8 9 Quite Involved

7. Please rate how realistic you found these aspects of the study:

(a) Making a stereo receiver purchase based on descriptions retrieved from a computer screen.

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

(b) The brand-attribute information given to you about the stereo receivers.

Quite Unrealistic 1 2 3 4 5 6 7 8 9 Quite Realistic

8. Based on the information that you were given from the High Fidelity magazine article and also the brand attribute information on the stereo receivers that you examined from the computer, to what extent do you agree with each of the following statements?

(a) Stereos which had more power usually had lower distortion.

Strongly Disagree 1 2 3 4 5 6 7 8 9 Strongly Agree

(b) Stereos which had high frequency response index values usually had shorter warranty periods.

Strongly Disagree 1 2 3 4 5 6 7 8 9 Strongly Agree

(c) Stereos which were higher priced usually had shorter warranty periods.

Strongly Disagree 1 2 3 4 5 6 7 8 9 Strongly Agree

(d) Stereos which had low distortion usually had higher signal-to-noise ratio.

Strongly Disagree 1 2 3 4 5 6 7 8 9 Strongly Agree

(e) Stereos which were high priced were usually more powerful.

Strongly Disagree 1 2 3 4 5 6 7 8 9 Strongly Agree

C. We would like to obtain some personal information for classification purposes.

1. Do you own a stereo system? Yes / No

If yes, which type is it?

Component ______

Compact ______

2. Compared to the average stereo receiver owner, did you consider yourself more or less familiar with the technical specifications of stereo receivers before you participated in this experiment?

Much Less Familiar 1 2 3 4 5 6 7 8 9 Much More Familiar

3. Sex Male / Female

4. Age _____ years

5. Are you a student? Yes / No

If yes, please indicate which level.

Freshman _____
Sophomore _____
Junior _____
Senior _____
Graduate _____

6. What is your occupation?

Full Time Student _____
Professional _____
Clerical _____
Other _____

7. Are you expecting to receive class credit for this experiment?
Yes / No

If Yes, Course ________ Instructor _______ Dept. ______

Thank you for your cooperation.

APPENDIX 10 - SEARCH TASK SOFTWARE AND TEXT DISPLAY FOR CORRELATION STUDY

```
'TEMP.BAS
R = 1
' open file for writing the practice data
OPEN "DATAPRAC.DAT" FOR APPEND AS #1
CLS
PRINT "PLEASE INPUT SUBJECT #";: INPUT IDNUM
PRINT #1 ,IDNUM
' open file for writing the search task data
OPEN "DATAFILE.DAT" FOR APPEND AS #2
CLS
PRINT #2 ,IDNUM
CLS

CALL Instruc1 'Call General Introduction
CALL Instruc2 'Call Keyboard Instruction 1
CALL Instruc3 'Call Keyboard Instruction 2
CALL Instruc4 'Call Practice Task
CLS

'load the practice task brand by attribute matrix
cls
DEFINT I,J,M,N
DIM BRATR$(15,6)
  FOR I = 1 TO 15
    FOR J=1 TO 6
      READ BRATR$(I,J)
  NEXT J,I
' load the attribute names
DIM ATTRNAM$(6)
  FOR I = 1 TO 6
   READ ATTRNAM$(I)
  NEXT I

'load the search task brand by attribute matrix
cls
DEFINT I,J,M,N
DIM BRATR1$(15,6)
  FOR M = 1 TO 15
    FOR N=1 TO 6
      READ BRATR1$(M,N)
  NEXT N,M

' load the attribute names
DIM ATTRNAM1$(6)
  FOR I = 1 TO 6
   READ ATTRNAM1$(I)
  NEXT I
```

```
CALL Instruc11     ' call the screen for info on attributes, brands and stopping

' Now request keyboard input
Start :      'Label
 IFLG3 = 0    ' Set the flag that checks for end to 0
 CALL Clearscrn(15,24)
   LOCATE 15,1
   PRINT "HOW DO YOU WANT TO SEARCH?"
   PRINT " PLEASE INPUT EITHER AN ATTRIBUTE # ( 1 - 6) OR BRAND CODE (A-O)?";
   locate 16,65,1     ' blink the cursor at input point

CALL  ReadKBD(CH1$)   ' Get the first character
CALL EchoCHR(CH1$)
CALL CheckChr(CH1$,IFLG1) ' Check the first character

IF IFLG1 = 9 THEN CALL ConfirmEnd(IFLG3,R) ' check to make sure that person
                   '   wants to end search
IF IFLG3 = 1 THEN GOTO Start                ' if end not confirmed start over

Secondinput:    ' label
IFLG4 = 0       ' Set the flag that checks end for second input to 0
CALL Clearscrn(17,24)
  LOCATE 17,1

SELECT CASE IFLG1    ' Check what kind of next input to ask for
  CASE  1       ' the first input was attribute
    PRINT " NOW PLEASE GIVE THE BRAND CODE ( A - O) ?";
    locate 17,43,1    ' blink the cursor

  CASE  2       ' the first input was a brand
    PRINT " NOW PLEASE GIVE THE ATTRIBUTE NUMBER ( 1 - 6) ?";
    Locate 17,49,1    ' blink the cursor

  CASE ELSE
    CALL  Mistake(CH1$)
    goto Start
END SELECT

CALL ReadKBD(CH2$)   ' get second input
CALL EchoChr$(CH2$)
CALL CheckChr(CH2$,iflg2)  ' check the second input

IF IFLG2 = 9 THEN CALL ConfirmEnd(IFLG4,R) ' check to make sure that person
                  '   wants to end search
IF IFLG4 = 1 THEN GOTO Secondinput             ' if end not confirmed start
'over
```

```
SELECT CASE IFLG1
  CASE 1    ' the first input was an attribute
    IF IFLG2 = 2 THEN EXIT SELECT
    CALL Mistake(CH2$)
    goto Secondinput
  CASE 2    ' the first input was a brand
    IF IFLG2 = 1 THEN EXIT SELECT
    CALL Mistake(CH2$)
    goto Secondinput
  CASE ELSE
    CALL Mistake(CH2$)
    goto Secondinput
END SELECT


CALL Coordinates(CH1$,CH2$,IFLG1,BRND,ATR)
PRINT :PRINT
IF R = 1 THEN CALL WriteFile1(CH1$,CH2$)  'write practice task data
IF R = 1 THEN PRINT "FOR BRAND "; CHR$(BRND+64);"    ";ATTRNAM$(ATR);" IS  ";
IF R = 1 THEN PRINT BRATR$(BRND,ATR)

'CALL Coordinates(CH1$,CH2$,IFLG1,BRND,ATR)  'write search task data
'PRINT :PRINT
IF R = 2 THEN CALL WriteFile2(CH1$,CH2$)
IF R = 2 THEN  PRINT "FOR BRAND "; CHR$(BRND+64);"    ";ATTRNAM1$(ATR);" IS  ";
IF R = 2 THEN  PRINT BRATR1$(BRND,ATR)

KEYP$ = FNPforKey$    ' Pause screen

GOTO Start  'loop back for next item in Practice task

Endroutine1:     ' label

PRINT #1, CHR$(13)    ' write CR to end this record
CLS
'PRINT "THANK YOU.":PRINT:PRINT "HAVE A NICE DAY ";CHR$(1)
CLOSE #1
'END

'$include "b:search.bas"
```

```
SUB Instruc11
cls
PRINT "================================================="
PRINT "FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS"
PRINT
PRINT "         PRICE                 ($)        =  1 "
PRINT "         WARRANTY              (MONTHS)   =  2 "
PRINT "         BATTERY LIFE          (HOURS)    =  3 "
PRINT "         WEIGHT                (OZS.)     =  4 "
PRINT "         MATH KEYS             (#)        =  5 "
PRINT "         FINANCIAL KEYS        (#)        =  6 "
PRINT
PRINT "FOR SEARCHING BRANDS, USE LETTERS  A -  O "
PRINT
PRINT "   TO STOP SEARCH,  USE  THE  &  KEY. "
PRINT "=================================================="
END SUB


R = 2  'FOR R = 2 go to Secondrun - Search Task

Secondrun:

CLS


CALL Instruc5 'Call Search Task Intro and Attribs
CALL Instruc6 'Call Attributes2
CALL Instruc7 'Call Attributes3
CALL Instruc81 'Call High Correlation - Part 1
CALL Instruc82 'Call High Correlation - Part 2
CALL Instruc91 'Call Search Task - High Involv - Part 1
CALL Instruc92 'Call Search Task - High Involv - Part 2
CLS


CALL Instruc111     ' call the screen for info on attributes, brands and
stopping

GOTO START  'loop back in Search Task

Endroutine2:     ' label

PRINT #2, CHR$(13)    ' write CR to end this record
CLS
PRINT "THANK YOU.":PRINT:PRINT "HAVE A NICE DAY ";CHR$(1)
CLOSE #2
END  'This ends the program
```

```
SUB Instruc111
cls
PRINT "=================================================="
PRINT "FOR SEARCHING ATTRIBUTES, USE THE FOLLOWING KEYS"
PRINT
PRINT "         PRICE              ($)       =  1 "
PRINT "         WARRANTY           (MONTHS)  =  2 "
PRINT "         DISTORTION         (%)       =  3 "
PRINT "         POWER              (WATTS)   =  4 "
PRINT "         FREQUENCY RESPONSE (INDEX)   =  5 "
PRINT "         SIGNAL / NOISE     (INDEX)   =  6 "
PRINT
PRINT "FOR SEARCHING BRANDS, USE LETTERS  A -  O "
PRINT
PRINT "   TO STOP SEARCH,  USE  THE  &  KEY. "
PRINT "==================================================="
END SUB

SUB WriteFile1(CH1$,CH2$)
 '   this writes the data on the file. It keeps track of recordlength
 '    so that Irrespective of search size max line length is 80
static count
 'PRINT #1, X$;" ";Y$;",";
 PRINT #1, CH1$;" ";CH2$;",";
 COUNT= COUNT +4
   IF COUNT >= 80 THEN
     PRINT #1 ,CHR$(13)
     COUNT = 0
   END IF
 END SUB



SUB WriteFile2(CH1$,CH2$)
 '   this writes the data on the file. It keeps track of recordlength
 '    so that Irrespective of search size max line length is 80
 static count
 'PRINT #2, X$;" ";Y$;",";
 PRINT #2, CH1$;" ";CH2$;",";
 COUNT= COUNT +4
   IF COUNT >= 80 THEN
     PRINT #2 ,CHR$(13)
     COUNT = 0
   END IF
 END SUB
```

```
SUB Coordinates(CH1$,CH2$,IFLG,X,Y)

  SELECT CASE IFLG
    CASE 1    ' first input is attribute numeric
      Y = VAL( CH1$)
      X = ASC( UCASE$(CH2$)) - 64   ' PUTS A=1, b=2 etc
    CASE 2    ' first input is alpha ie brand
      Y = VAL( CH2$)
      X = ASC( UCASE$(CH1$)) - 64   ' put A=1 etc
   END SELECT

 END SUB

SUB Mistake(CH$)
 LOCATE 19,1
 PRINT " YOU HAVE MADE AN ERROR"
 PRINT "    YOU PRESSED  ";CH$
 PRINT " REMEMBER, FOR ATTRIBUTES, PRESS 1 - 6"
 PRINT "              FOR BRANDS    , PRESS A - O"
 KEYP$ = FNPforKey$
 CALL Clearscrn(19,24)
END SUB

SUB Clearscrn(X1,X2)
   'clear the screen between lines x1 and x2 by writing blanks
   FOR I = X1 TO X2
     LOCATE I,1
     PRINT SPACE$(79);
   NEXT I
END SUB

DEF FN PforKey$
 locate 24,1
 PRINT "Press any key to continue .....";
 WHILE NOT INSTAT : WEND
 FN PforKey$ = INKEY$
END DEF

SUB CheckChr(Ch$,IFLG1)
iflg1=0
  Ch$ = UCASE$(Ch$) ' convert to uppercase
  IF ASC(Ch$) >= 49 AND ASC(ch$) <= 54 THEN
    IFLG1 = 1 ' it is numeric in right range
  ELSEIF ASC(Ch$) >=65 and ASC(ch$) <= 79 THEN
    IFLG1 = 2 ' it is an alphabetic character in right range
  ELSEIF ASC(Ch$) = 38 THEN
    IFLG1 = 9  ' THE & character implies end of search
  ELSE
    IFLG1 = 3 ' it is some other character outside range
  END IF
END SUB
```

```
SUB ReadKBD(RetChar$)
' THis reads a character from the keyboard and returns a char string
   DO
    RetChar$ = INKEY$
   LOOP UNTIL RetChar$<>""
END SUB
SUB EchoCHR(CH$)
  PRINT CH$;
END SUB

SUB Confirmend(IFLAG,R)
  Print " You have pressed the END SEARCH key (&). "
  print: Print" Please confirm that you want to END SEARCH by pressing "
  print    "          the    &    key again. Thanks."
  Call ReadKBD(Ch3$)
  Call EchoCHR(Ch3$)
  CALL CheckChr(Ch3$,IFLGEND)
  IF IFLGEND = 9 AND R = 1 THEN GOTO   EndRoutine1
  IF IFLGEND = 9 and R = 2 THEN GOTO   Endroutine2
  'ENDIF=
    IFLAG=1  ' end not confirmed
END SUB
```

```
'data for practice task - calculators

110 DATA 15,3,6,4,5,2
120 DATA 30,6,12,2,10,8
130 DATA 25,6,9,4,5,4
140 DATA 40,12,20,2,20,12
150 DATA 10,3,6,4,10,6
160 DATA 20,6,12,2,10,8
170 DATA 30,9,20,3,15,8
180 DATA 35,12,15,3,10,6
190 DATA 40,9,6,3,20,12
200 DATA 15,3,6,2,10,4
210 DATA 20,6,6,4,15,8
220 DATA 30,12,12,2,15,12
230 DATA 25,9,15,3,10,4
240 DATA 20,3,3,2,5,2
250 DATA 15,6,6,3,5,6
 DATA PRICE,WARRANTY,BATTERY LIFE,WEIGHT,# OF MATH KEYS,# OF FINANCIAL KEYS


'data for search task - stereos

310 DATA 150,2,.04,20,20,50
320 DATA 200,2,.01,60,40,20
330 DATA 250,3,.02,80,50,20
340 DATA 250,4,.05,40,30,30
350 DATA 350,6,.01,80,30,40
360 DATA 150,6,.02,80,40,30
370 DATA 200,3,.05,60,30,40
380 DATA 250,2,.01,100,10,30
390 DATA 300,6,.05,40,20,20
400 DATA 250,6,.01,20,40,30
410 DATA 250,5,.01,100,40,30
420 DATA 300,4,.03,20,30,20
430 DATA 200,4,.02,100,20,20
440 DATA 350,5,.02,60,10,30
450 DATA 350,6,.03,20,40,30
 DATA PRICE,WARRANTY,% DISTORTION,POWER,FREQUENCY RESPONSE,SIGNAL/NOISE
```

```
SUB Instruc1
cls
'INSTRUC1 - GENERAL INTRODUCTION

PRINT "WELCOME! WE APPRECIATE YOUR PARTICIPATING IN THIS CONSUMER BEHAVIOR"
PRINT "STUDY. WE ARE INTERESTED IN DETERMINING WHAT KIND OF INFORMATION"
PRINT "CONSUMERS LIKE YOURSELF FIND USEFUL IN A VARIETY OF PRODUCT CHOICE"
PRINT "SITUATIONS."
PRINT
PRINT "YOU WILL BE WORKING WITH A COMPUTER THAT HAS DIFFERENT KINDS OF PRODUCT"
PRINT "INFORMATION STORED IN ITS MEMORY."
PRINT
PRINT "IN THE FIRST PHASE OF THE EXPERIMENT, YOU WILL BE GIVEN IMPORTANT"
PRINT "INSTRUCTIONS ON HOW TO USE THE KEYBOARD TO ACQUIRE THIS INFORMATION."
PRINT "THEN YOU WILL DO A PRACTICE TASK TO FAMILIARIZE YOU WITH THE EQUIPMENT"
PRINT "AND THE STUDY PROCEDURES."
PRINT
PRINT "FOLLOWING THE PRACTICE TASK, YOU WILL PARTICIPATE IN THE MAIN STUDY."
PRINT
PRINT "FINALLY, YOU WILL BE ASKED TO FILL OUT A QUESTIONNAIRE ABOUT THE STUDY."
PRINT "======================================================================"
'PRINT"Press any key to continue ....."
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc2
cls
'INSTRUC2 - KEYBOARD INSTRUCTIONS

PRINT "INSTRUCTIONS FOR USING THE KEYBOARD:"
PRINT
PRINT "THE SCREEN WILL CONTINUOUSLY DISPLAY THE LETTERS A-O WHICH IDENTIFY"
PRINT "BRANDS, AND A LIST OF SIX ATTRIBUTES. EACH ATTRIBUTE IS ASSIGNED A "
PRINT "NUMBER, FOR EASE OF TYPING."
PRINT
PRINT "YOU CAN OBTAIN INFORMATION ABOUT THE BRANDS ON THOSE ATTRIBUTES BY"
PRINT "SPECIFYING THE ITEM YOU WANT TO SEE."
PRINT
PRINT "FOR EACH ITEM THAT YOU WANT, PLEASE TYPE"
PRINT "EITHER            A BRAND, FOLLOWED BY AN ATTRIBUTE"
PRINT "OR                AN ATTRIBUTE, FOLLOWED BY A BRAND."
PRINT
PRINT "IF YOU TYPE IN A LETTER FIRST, THE NEXT INPUT MUST BE A NUMBER,"
PRINT "DENOTING THE ATTRIBUTE YOU WANT TO EXAMINE. SIMILARLY, IF YOU TYPE IN"
PRINT "A NUMBER FIRST, THE NEXT INPUT MUST BE A LETTER, DENOTING THE BRAND."
PRINT
PRINT "IF YOU MAKE A MISTAKE, THE PROGRAM WILL PROMPT YOU TO TYPE IN THE"
PRINT "INPUTS CORRECTLY."
PRINT "======================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc3
cls
'INSTRUC3 - KEYBOARD INSTRUCTIONS

PRINT "YOU MAY REQUEST ANY ITEM OF INFORMATION AS OFTEN AS YOU PLEASE ON THE"
PRINT "COMPUTER SCREEN. HOWEVER, PLEASE DO NOT TAKE NOTES ON SEPARATE SHEETS"
PRINT "OF PAPER."
PRINT
PRINT "FOR LETTERS, YOU MAY USE UPPER OR LOWER CASE."
PRINT "FOR NUMBERS, PLEASE USE THE KEYS AT THE TOP OF THE KEYBOARD."
PRINT "================================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc4
cls
'INSTRUC4 - PRACTICE TASK INSTRUCTION

PRINT "YOU ARE NOW GOING TO DO THE PRACTICE TASK. THIS IS INTENDED TO"
PRINT "FAMILIARIZE YOU WITH USING THE KEYBOARD AND THE STUDY PROCEDURES."
PRINT
PRINT "WE WOULD LIKE YOU TO IMAGINE THAT YOU WANT TO BUY A POCKET CALCULATOR."
PRINT "INFORMATION ON 15 BRANDS (A-O) AND ON 6 ATTRIBUTES (TO BE LISTED)"
PRINT "IS STORED IN THE COMPUTER."
PRINT
PRINT "PLEASE USE THE KEYBOARD TO OBTAIN INFORMATION ABOUT THE CALCULATORS."
PRINT "YOU MAY STOP WHEN YOU FEEL COMFORTABLE WITH USING THE KEYBOARD."
PRINT "======================================================================="
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc5
cls
'INSTRUC5 - SEARCH TASK INTRODUCTION AND ATTRIBUTE DESCRIPTIONS

PRINT "WELCOME TO THE MAIN STUDY. BEFORE YOU BEGIN, WE WOULD LIKE YOU TO"
PRINT "CAREFULLY READ THE FOLLOWING INSTRUCTIONS."
PRINT
PRINT "THIS STUDY IS CONCERNED WITH THE PRODUCT CATEGORY OF STEREO RECEIVERS."
PRINT "WHEN BUYING STEREO RECEIVERS, MOST PEOPLE CONSIDER A FEW KEY"
PRINT "CHARACTERISTICS OF STEREO RECEIVERS. THESE BASIC CHARACTERISTICS ARE"
PRINT "BRIEFLY DESCRIBED BELOW. PLEASE READ THESE DESCRIPTIONS CAREFULLY."
PRINT
PRINT "1. PRICE:"
PRINT "THIS IS THE PRICE STATED IN DOLLARS THAT YOU WOULD ACTUALLY PAY FOR"
PRINT "THE STEREO RECEIVER AT A RETAIL OUTLET."
PRINT
PRINT "2. WARRANTY:"
PRINT "THIS IS THE NUMBER OF MONTHS FROM DATE OF PURCHASE FOR WHICH THE"
PRINT "MANUFACTURER PROVIDES A COMPREHENSIVE WARRANTY ON PARTS AND LABOR."
PRINT
PRINT "======================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc6
cls
'INSTRUC6 - ATTRIBUTE DESCRIPTIONS

PRINT "3. DISTORTION:"
PRINT
PRINT "THIS IS A MEASURE OF AMPLIFIER ACCURACY. IT INDICATES WHETHER THE"
PRINT "AMPLIFIER IS INTERNALLY GENERATING HARMONICS (I.E. MULTIPLES OF THE"
PRINT "ORIGINAL FREQUENCIES) THAT AFFECT SOUND QUALITY ADVERSELY. DISTORTION"
PRINT "IS INDICATED AS A PERCENTAGE. THE LOWER THE PERCENTAGE DISTORTION"
PRINT "SCORE, THE BETTER THE STEREO. FOR EXAMPLE, OTHER THINGS BEING EQUAL, A"
PRINT "STEREO WITH .01% DISTORTION IS BETTER THAN ONE WITH .05% DISTORTION."
PRINT
PRINT "4. POWER:"
PRINT
PRINT "THIS IS A MEASURE OF THE AMOUNT OF WORK THE RECEIVER'S AMPLIFIER CAN DO"
PRINT "WITH BOTH CHANNELS BEING DRIVEN. POWER IS MEASURED IN WATTS. A STEREO"
PRINT "THAT DELIVERS MORE POWER IS MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS"
PRINT "BEING EQUAL, A STEREO WITH POWER OUTPUT OF 60 WATTS IS BETTER THAN ONE"
PRINT "DELIVERING 20 WATTS."
PRINT "======================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc7
cls
'INSTRUC7 - ATTRIBUTE DESCRIPTIONS

PRINT "5. FREQUENCY RESPONSE:"
PRINT
PRINT "DESIGN AND COMPONENT IMPERFECTIONS CAN RESULT IN NON-UNIFORM"
PRINT "AMPLIFICATION OF DIFFERENT FREQUENCIES. THIS NON-UNIFORMITY LOWERS"
PRINT "SOUND QUALITY. UNIFORMITY OF FREQUENCY RESPOSE IS MEASURED BY AN"
PRINT "INDEX. HIGHER INDEX VALUES INDICATE GREATER UNIFORMITY OF FREQUENCY"
PRINT "RESPONSE AND ARE MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS BEING"
PRINT "EQUAL, A STEREO WITH FREQUENCY RESPONSE OF 40 IS BETTER THAN ONE WITH"
PRINT "FREQUENCY RESPONSE OF 20."
PRINT
PRINT "6. SIGNAL TO NOISE RATIO:"
PRINT
PRINT "THIS MEASURES HOW MUCH EXTRANEOUS NOISE A RECEIVER'S PHONO STAGE"
PRINT "GENERATES. IT IS MEASURED BY AN INDEX. HIGHER VALUES OF SIGNAL TO"
PRINT "NOISE RATIO INDEX ARE MORE DESIRABLE. FOR EXAMPLE, OTHER THINGS BEING"
PRINT "EQUAL, A STEREO WITH SIGNAL TO NOISE RATIO OF 30 IS BETTER THAN ONE"
PRINT "WITH A RATIO OF 10."
PRINT
PRINT "PLEASE REVIEW THESE INSTRUCTIONS TO ENSURE THAT YOU HAVE UNDERSTOOD"
PRINT "THEM. IF YOU HAVE ANY QUESTIONS PLEASE ASK THE RESEARCH MONITOR."
PRINT "OTHERWISE, PLEASE TELL THE RESEARCH MONITOR THAT YOU ARE READY TO"
PRINT "CONTINUE."
PRINT "======================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc81
cls
'INSTRUC81 - HIGH CORRELATION - PART 1

PRINT "HIGH FIDELITY MAGAZINE RECENTLY COMMISSIONED A STUDY WHICH EXAMINED"
PRINT "SOME COMMON BELIEFS THAT PEOPLE HAVE ABOUT STEREO RECEIVERS. THUS,"
PRINT "MANY PEOPLE BELIEVE THAT HIGHER PRICED STEREO RECEIVERS USUALLY HAVE"
PRINT "LONGER WARRANTIES. ALSO, MANY PEOPLE BELIEVE THAT A STEREO"
PRINT "RECEIVER'S DISTORTION IS NEGATIVELY RELATED TO ITS POWER. THUS, PEOPLE"
PRINT "BELIEVE THAT RECEIVERS WITH LOW PERCENTAGE DISTORTION ARE USUALLY THE"
PRINT "ONES THAT HAVE HIGH POWER OUTPUT IN WATTS."
PRINT "========================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc82
cls
'INSTRUC82 - HIGH CORRELATION - PART 2

PRINT "THE HIGHLY RESPECTED STEREO EXPERTS WHO CONDUCTED THE HIGH FIDELITY"
PRINT "MAGAZINE STUDY REPORTED THAT BOTH THESE COMMONLY HELD BELIEFS ARE"
PRINT "TRUE. FIRST, THEY FOUND THAT HIGHER PRICED STEREOS DO INDEED HAVE"
PRINT "SIGNIFICANTLY LONGER MANUFACTURER'S WARRANTIES THAN LOWER PRICED"
PRINT "RECEIVERS."
PRINT
PRINT "MOREOVER, IN EXTENSIVE TECHNICAL TESTS, THESE EXPERTS ALSO CONFIRMED"
PRINT "THAT THE DISTORTION LEVEL OF A RECEIVER IS NEGATIVELY RELATED TO ITS"
PRINT "POWER OUTPUT. BECAUSE THERE IS A RESERVE OF POWER AVAILABLE, BRIEF"
PRINT "SPIKES IN LOUDNESS CAN BE HANDLED WITHOUT THE SOUND BEING DISTORTED."
PRINT
PRINT "CONVERSELY, RECEIVERS WITH LOW POWER OUTPUT TEND TO HAVE HIGH"
PRINT "PERCENTAGE DISTORTION. SINCE THERE IS NO RESERVE POWER AVAILABLE,"
PRINT "SPIKES IN LOUDNESS TEND TO DISTORT THE SOUND."
PRINT
PRINT "THE STUDY DID NOT REVEAL ANY OTHER SIGNIFICANT RELATIONSHIPS BETWEEN"
PRINT "THE DIMENSIONS THAT PEOPLE USE TO EVALUATE STEREO RECEIVERS."
PRINT
PRINT "PLEASE REVIEW THE ABOVE INFORMATION AND INFORM THE MONITOR WHEN YOU"
PRINT "ARE READY TO PROCEED."
PRINT "================================================================================="
KEYP$ = FNPforKey$
END SUB
```

```
'
'SUB Instruc81
'cls
'INSTRUC81 - NO CORR - PART 1
'
'PRINT "HIGH FIDELITY MAGAZINE RECENTLY COMMISSIONED A STUDY WHICH EXAMINED"
'PRINT "SOME COMMON BELIEFS THAT PEOPLE HAVE ABOUT STEREO RECEIVERS. THUS,"
'PRINT "MANY PEOPLE BELIEVE THAT HIGHER PRICED STEREO RECEIVERS USUALLY HAVE"
'PRINT "LONGER WARRANTIES. ALSO, MANY PEOPLE BELIEVE THAT A STEREO"
'PRINT "RECEIVER'S DISTORTION IS NEGATIVELY RELATED TO ITS POWER. THUS, PEOPLE"
'PRINT "BELIEVE THAT RECEIVERS WITH LOW PERCENTAGE DISTORTION ARE USUALLY THE"
'PRINT "ONES THAT HAVE HIGH POWER OUTPUT IN WATTS."
'PRINT "==========================================================================="
'KEYP$ = FNPforKey$
'END SUB
```

```
'
'SUB Instruc82
'cls
'INSTRUC82 - NO CORR - PART 2
'
'PRINT "THE HIGHLY RESPECTED STEREO EXPERTS WHO CONDUCTED THE HIGH FIDELITY"
'PRINT "MAGAZINE STUDY REPORTED THAT BOTH THESE COMMONLY HELD BELIEFS ARE"
'PRINT "NOT TRUE. FIRST, THEY FOUND THAT THERE WAS NO CLEAR RELATIONSHIP"
'PRINT "BETWEEN STEREO PRICES AND LENGTHS OF WARRANTY. BOTH PRICES AND"
'PRINT "WARRANTIES WERE SET BY MANUFACTURERS BASED ON SALES AND PROFIT"
'PRINT "EXPECTATIONS. CONSEQUENTLY, ONE IS JUST AS LIKELY TO FIND LONGER"
'PRINT "OR SHORTER WARRANTIES IN HIGH AND LOW PRICED STEREO RECEIVERS."
'PRINT
'PRINT "MOREOVER, IN EXTENSIVE TECHNICAL TESTS, THESE EXPERTS ALSO FOUND THAT"
'PRINT "CONTRARY TO POPULAR BELIEF, THERE IS NO APPARENT RELATIONSHIP BETWEEN"
'PRINT "THE DISTORTION LEVEL OF A RECEIVER AND ITS POWER OUTPUT. ADVANCES IN"
'PRINT "CIRCUIT DESIGN AND AMPLIFIER ELECTRONICS HAVE APPARENTLY MADE IT"
'PRINT "POSSIBLE FOR EVEN LOW POWER STEREO RECEIVERS TO AMPLIFY BRIEF BURSTS"
'PRINT "OF LOUD SOUND WITHOUT SIGNIFICANT DISTORTION. THUS, ONE IS JUST AS"
'PRINT "AS LIKELY TO FIND HIGH OR LOW DISTORTION LEVELS IN HIGH OR LOW POWER"
'PRINT "STEREO RECEIVERS."
'PRINT
'PRINT "THE STUDY DID NOT REVEAL ANY OTHER SIGNIFICANT RELATIONSHIPS BETWEEN"
'PRINT "THE DIMENSIONS THAT PEOPLE USE TO EVALUATE STEREO RECEIVERS."
'PRINT
'PRINT "PLEASE REVIEW THE ABOVE INFORMATION AND INFORM THE MONITOR WHEN YOU"
'PRINT "ARE READY TO PROCEED."
'PRINT "================================================================"
'KEYP$ = FNPforKey$
'END SUB
```

```
SUB Instruc91
cls
'INSTRUC91 - SEARCH TASK - HIGH INVOLVEMENT - PART 1

PRINT "WE WOULD NOW LIKE YOU TO IMAGINE THAT YOU ARE GOING TO PURCHASE A"
PRINT "STEREO RECEIVER AS A GIFT FOR A FAVORITE RELATIVE FOR HIS/HER"
PRINT "BIRTHDAY. YOU HAVE SET YOURSELF A BUDGET OF $400 WITHIN WHICH YOU WILL"
PRINT "BUY THIS RECEIVER."
PRINT
PRINT "SINCE YOU WOULD LIKE TO BUY THIS FAVORITE RELATIVE A RECEIVER THAT THEY"
PRINT "WOULD REALLY LIKE, YOU HAVE ASKED HIM/HER WHAT RECEIVER DIMENSIONS"
PRINT "S(HE) THINKS ARE IMPORTANT. IN RESPONSE, YOUR RELATIVE TOLD YOU THAT"
PRINT "S(HE) BELIEVES THAT ALL SIX FEATURES OF STEREO RECEIVERS SHOULD"
PRINT "RECEIVE EQUAL IMPORTANCE IN THE PURCHASE."
PRINT "====================================================================="
KEYP$ = FNPforKey$
END SUB
```

```
SUB Instruc92
cls
'INSTRUC92 - SEARCH TASK - HIGH INVOLVEMENT - PART 2

PRINT "IN ITS MEMORY, THE COMPUTER HAS INFORMATION ABOUT 15 BRANDS OF STEREO"
PRINT "RECEIVERS (IDENTIFIED BY THE LETTERS A-O). THE INFORMATION CONCERNS"
PRINT "THE SIX FEATURES (PRICE, WARRANTY, DISTORTION, POWER, FREQUENCY"
PRINT "RESPONSE AND SIGNAL TO NOISE RATIO). THIS INFORMATION CAN BE OBTAINED"
PRINT "ONE ITEM AT A TIME, USING THE COMPUTER KEYBOARD. INSTRUCTIONS ON HOW"
PRINT "TO USE THE KEYBOARD WILL BE GIVEN ONCE YOU START."
PRINT
PRINT "USING THE COMPUTER TO ACQUIRE INFORMATION ON THESE STEREO RECEIVERS,"
PRINT "PLEASE CHOOSE THE BEST BRAND, KEEPING IN MIND THAT THE SIX FEATURES"
PRINT "SHOULD BE GIVEN EQUAL IMPORATNCE IN BUYING THE GIFT. FEEL FREE TO USE"
PRINT "ANY INFORMATION THAT WAS GIVEN TO YOU IN THE STUDY THAT YOU THINK WILL"
PRINT "HELP YOUR DECISION."
PRINT
PRINT "ALSO, PLEASE NOTE THAT YOU MAY EXAMINE ANY GIVEN ITEM OF INFORMATION AS"
PRINT "OFTEN AS YOU LIKE ON THE COMPUTER SCREEN, BUT YOU ARE NOT PERMITTED TO"
PRINT "WRITE THIS DOWN."
PRINT "======================================================================"
KEYP$ = FNPforKey$
END SUB
```

```
'
'SUB Instruc91
'cls
'INSTRUC91 - SEARCH TASK - LOW INVOLVEMENT - PART 1
'
'PRINT "WE WOULD NOW LIKE YOU TO IMAGINE THAT YOU ARE ACCOMPANYING A"
'PRINT "CASUAL FRIEND ON A SHOPPING TRIP. YOUR FRIEND HAS TO PURCHASE A STEREO"
'PRINT "RECEIVER AS A BIRTHDAY GIFT FOR A RELATIVE AND HAS ASKED YOU TO HELP"
'PRINT "IN THE PURCHASE. YOUR FRIEND HAS SET A BUDGET OF $400 WITHIN WHICH"
'PRINT "S(HE) WILL BUY THIS RECEIVER."
'PRINT
'PRINT "YOUR FRIEND TELLS YOU THAT HIS/HER RELATIVE HAS INDICATED THAT ALL SIX"
'PRINT "FEATURES OF THE STEREO RECEIVER SHOULD RECEIVE EQUAL IMPORTANCE IN THE"
'PRINT "PURCHASE."
'PRINT "================================================================================"
'KEYP$ = FNPforKey$
'END SUB
```

```
'
'SUB Instruc92
'cls
'INSTRUC92 - SEARCH TASK - LOW INVOLVEMENT - PART 2
'
'PRINT "IN ITS MEMORY, THE COMPUTER HAS INFORMATION ABOUT 15 BRANDS OF STEREO"
'PRINT "RECEIVERS (IDENTIFIED BY THE LETTERS A-O). THE INFORMATION CONCERNS"
'PRINT "THE SIX FEATURES (PRICE, WARRANTY, DISTORTION, POWER, FREQUENCY"
'PRINT "RESPONSE AND SIGNAL TO NOISE RATIO). THIS INFORMATION CAN BE OBTAINED"
'PRINT "ONE ITEM AT A TIME, USING THE COMPUTER KEYBOARD. INSTRUCTIONS ON HOW"
'PRINT "TO USE THE KEYBOARD WILL BE GIVEN ONCE YOU START."
'PRINT
'PRINT "USING THE COMPUTER TO ACQUIRE INFORMATION ON THESE STEREO RECEIVERS,"
'PRINT "PLEASE CHOOSE THE BEST BRAND, KEEPING IN MIND THAT THE SIX FEATURES"
'PRINT "SHOULD BE GIVEN EQUAL IMPORTANCE IN BUYING THE GIFT. FEEL FREE TO USE"
'PRINT "ANY INFORMATION THAT WAS GIVEN TO YOU IN THE STUDY THAT YOU THINK WILL"
'PRINT "HELP YOUR DECISION."
'PRINT
'PRINT "ALSO, PLEASE NOTE THAT YOU MAY EXAMINE ANY GIVEN ITEM OF INFORMATION"
'PRINT "AS OFTEN AS YOU LIKE ON THE COMPUTER SCREEN, BUT YOU ARE NOT PERMITTED"
'PRINT "TO WRITE THIS DOWN."
'PRINT "======================================================================="
'KEYP$ = FNPforKey$
'END SUB
'TRON
```

REFERENCES

Alba, Joseph W. (1983), "The Effects of Product Knowledge on the Comprehension, Retention, and Evaluation of Product Information," in Advances in Consumer Research, 10, Richard P. Bagozzi and Alice M. Tybout eds., Ann Arbor, MI: Association for Consumer Research, 577-580.

----- and Amitava Chattopadhyay (1985), "Effects of Context and Part-Category Cues on Recall of Competing Brands," Journal of Marketing Research, 22, 340-349.

----- and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," Journal of Consumer Research, 13 (March), 411-454.

----- and Howard Marmorstein (1987), "The Effects of Frequency Knowledge on Consumer Decision Making," Journal of Consumer Research, 14 (June), 14-25.

Alloy, Lauren B. and Naomi Tabachnik (1984), "Assessment of Covariation by Humans and Animals: The Joint Influence of Prior Expectations and Current Situational Information," Psychological Review, 91 (January), 112-149.

Anderson, N.H. (1981), Foundations of Information Integration Theory, New York: Academic Press.

----- (1982), Methods of Information Integration Theory, New York: Academic Press.

Arch, David C., James R. Bettman and Pradeep Kakkar (1978), "Subjects' Information Processing in Information Display Board Studies," in Advances in Consumer Research, Vol. 5, H. Keith Hunt ed., Ann Arbor, MI: Association for Consumer Research, 555-560.

Arkes, Hal R. and Marilyn R. Freedman (1984), "A Demonstration of The Costs and Benefits of Expertise in Recognition Memory," Memory and Cognition, 12(1), 84-89.

Assar, Amardeep and Dipankar Chakravarti (1984), "Attribute Range Knowledge: Effects on Consumers' Evaluation of Brand-Attribute Information and Search Patterns in Choice," in 1984 A.M.A. Educators Proceedings, Russell W. Belk, Robert Peterson, Gerald S. Albaum, Morris B. Holbrook, Roger A. Kerin, Naresh K. Malhotra and Peter Wright eds., Chicago: American Marketing Association, 62-67.

Axell, Bo (1974), "Price Dispersion and Information--An Adaptive Sequential Search Model," Swedish Journal of Economics, 76, 77-78.

Belk, Russell W., (1974), "An Exploratory Assessment of Situational Effects in Buyer Behavior," Journal of Marketing Research, 11, 156-163.

----- (1981), "Effects of Gift-Giving Involvement on Gift Selection Strategies," in Advances in Consumer Research, Vol. 9, Andrew Mitchell ed., Ann Arbor, MI: Association for Consumer Research, 408-411.

Bettman, James R. (1979), An Information Processing Theory of Consumer Choice, Reading, MA: Addison-Wesley.

----- and C. Whan Park (1980), "Effects of Prior Knowledge and Experience and Phase of the Choice Process on Consumer Decision Processes," Journal of Consumer Research, 7 (December), 234-248.

-----, Deborah Roedder John, and Carol A. Scott (1984), "Consumers' Assessment of Covariation," in Advances in Consumer Research, 11, Thomas C. Kinnear ed., Ann Arbor, MI: Association for Consumer Research, 466-471.

-----, -----, and ----- (1986), "Covariation Assessment by Consumers," Journal of Consumer Research, 13 (December), 316-326.

----- and Michel A. Zins (1979), "Information Format and Choice Task Effects in Decision Making," Journal of Consumer Research, 6 (September), 141-53.

Biehal, Gabriel J. (1983), "Consumers' Prior Experiences and Perceptions in Auto Repair Choice," Journal of Marketing, 47 (3), 82-91.

-----, and Dipankar Chakravarti (1982), "Information-presentation Format and Learning Goals as Determinants of Consumers' Memory Retrieval and Choice Processes," Journal of Consumer Research, 8 (March), 431-441.

-----, and ----- (1983), "Information Accessibility as a Moderator of Consumer Choice," Journal of Consumer Research, 10 (June), 1-14.

-----, and ----- (1986), "Consumers' use of Memory and External Information in Choice: Macro and Micro Perspectives," Journal of Consumer Research, 12 (March), 382-405.

Brucks, Merrie (1985), "The Effects of Product Class Knowledge on Information Search Behavior," Journal of Consumer Research, 12 (June), 1-16.

-----, and Dipankar Chakravarti (1987), "Knowledge of Terminology and Inter-Attribute Correlation in a Product Category: Effects on Consumer Search, Evaluation and Choice," Working Paper, University of Arizona.

Chakravarti, Dipankar, and John G. Lynch, Jr. (1983), "A Framework for Exploring Context Effects on Consumer Judgement and Choice," in Advances in Consumer Research, 10, R.P. Bagozzi and A.M. Tybout eds., Ann Arbor, MI: Association for Consumer Research, 289-297.

Chase, William G. and Herbert A. Simon (1973), "Perception in Chess," Cognitive Psychology, 4 (January), 55-81.

Chiesi, Harry L., George J. Spilich, and James T. Voss (1979), "Acquisition of Domain-Related Information in Relation to High and Low Domain Knowledge," Journal of Verbal Learning and Verbal Behavior, 18 (June), 257-273.

Clarke, Keith and Russell W. Belk (1979), "The Effects of Product Involvement and Task Definition on Anticipated Consumer Effort," in Advances in Consumer Research, Vol. 6, William L. Wilkie ed., Ann Arbor, MI: Association for Consumer Research, 313-318.

Cohen, Joel B. (1983), "Involvement and You: 1000 Great Ideas," in Advances in Consumer Research, Volume 10, R. Bagozzi and A. Tybout eds., Ann Arbor, MI: Association for Consumer Research, 324-327.

-----, Paul W. Miniard, and Peter R. Dickson (1980), "Information Integration: An Information Processing Perspective," in Advances in Consumer Research, 7, Jerry C. Olson ed., Ann Arbor, MI: Association for Consumer Research, 161-169.

Craik, Fergus I.M., and Robert S. Lockhart (1972), "Levels of Processing: A Framework for Memory Research," Journal of Verbal Learning and Verbal Behavior, 11, 671-84.

Dick, Alan (1985), "Memory Influences on Inferential Processes During Consumer Choice," Unpublished manuscript, University of Florida.

-----, Dipankar Chakravarti and Gabriel J. Biehal (1987), "Memory Based Inferential Processes in Consumer Judgement and Choice," Working Paper, University of Arizona.

Dickson, Peter R. (1982), "Person-Situation: Segmentation's Missing Link," Journal of Marketing, 46 (Fall), 56-64.

Dohan, Michael R., (1976), "Cost Maximization and Buyer Dependence on Seller Provided information," Journal of Economic Issues, 10 (2), 430-452.

Duncan, Calvin P. and Richard W. Olshavsky (1982), "External Search: The Role of Consumer Beliefs," Journal of Marketing Research, 19 (February), 32-43.

Feldman, Jack M. and John G. Lynch, Jr. (1987), "Self-Generated Validity: Effects of Measurement on Belief, Attitude, Intention and Behavior," Working Paper, Center for Consumer Research, University of Florida.

Fishbein, Martin and Icek Ajzen (1975), Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, Reading, MA: Addison-Wesley.

Fiske, Susan T., Donald R. Kinder, and W. Michael Larter (1983), "The Novice and the Expert: Knowledge Based Strategies in Political Cogniton," Journal of Experimental Social Psychology, 19, 380-400.

Gastwirth, Joseph L. (1976), "On Probabilistic Models of Consumer Search for Information," Quarterly Journal of Economics, 90 (1), 38-50.

Goldman, Arieh and J.K. Johansson (1978), "Determinants of Search for Lower Prices: An Empirical Assessment of the Economics of Information Theory," Journal of Consumer Research, 5 (December), 176-186.

Hagerty, Michael R. and David A. Aaker (1984), "A Normative Model of Consumer Information Processing," Marketing Science, 3(3), 227-246.

Helson, H. (1964), "Adaptation Level Theory," New York, NY: Harper and Row.

Houston, Michael J. and Michael L. Rothschild, (1977) "A Paradigm for Research on Consumer Involvement," Working Paper, University of Wisconsin, Madison.

Howard, J.A. and J.N. Sheth (1969), The Theory of Buyer Behavior, New York, NY: Wiley.

Huber, Joel and John McCann (1982), "The Impact of Inferential Beliefs on Product Evaluations," Journal of Marketing Research, 14, 324-333.

Hutchinson, J.W. (1983), "On the Locus of Range Effects in Judgement and Choice," in Advances in Consumer Research, 10, R. Bagozzi and Alice M. Tybout eds., Ann Arbor, MI: Association for Consumer Research.

John, Deborah Roedder, Carol A. Scott, and James R. Bettman (1986), "Sampling Data for Covariation Assessment: The Effects of Prior Beliefs on Search Patterns," Journal of Consumer Research, 13 (June), 38-47.

Johnson, Eric J., and J. Edward Russo (1978), "What is Remembered After a Purchase Decision?" Working Paper, Center for Decision Research, Graduate School of Business, University of Chicago, Chicago, IL.

----- and ----- (1984), "Product Familiarity and Learning New Information," Journal of Consumer Research, 11 (June), 542-550.

Kakkar, Pradeep and Richard J. Lutz (1981), "Situational Influence in Consumer Behavior: A Review," in Perspectives in Consumer Behavior, H.H. Kassarjian and Thomas S. Robertson eds., Glenview, IL: Scott Foresman, 204-214.

Klayman, Joshua (1983), "Simulations of Six Decision Strategies: Comparisons of Search Patterns, Processing Characteristics, and Response to Task Complexity," Working Paper, Center for Decision Research, University of Chicago.

Kohn, Meir G. and Steven Shavell (1974), "The Theory of Search," Journal of Economic Theory, 9 (2), 93-123.

Lambert, Z. (1970), "Product Perception: An Important Variable in Pricing," Journal of Marketing, 34, No. 4, 68-71.

Larkin, Jill, John McDermott, Dorothea P. Simon, and Herbert A. Simon (1980), "Expert and Novice Performance in Solving Physics Problems," Science, 208 (June), 1335-1342.

Lastovicka, John L. (1979), "Questioning the Concept of Involvement Defined Product Classes," in Advances in Consumer Research, Vol. 6, William L. Wilkie ed., Ann Arbor, MI: Association for Consumer Research, 174-179.

Leavitt, H.J. (1954), "A Note on Some Experimental Findings about Price," Journal of Business, 27, 205-210.

Lingle, John H. and Thomas M. Ostrom (1981), "Principles of Memory and Cognition in Attitude Formation," in Cognitive Responses in Persuasion, Richard E. Petty, Thomas M. Ostrom and Timothy C. Brock eds., Hillsdale, NJ: Lawrence Erlbaum, 399-420.

Lussier, Denis A. and Richard W. Olshavsky (1979), "Task Complexity and Contingent Processing in Brand Choice," Journal of Consumer Research, 6 (September), 154-165.

Lynch, John G., Jr. (1981), "Looking for Confirming Evidence: The case of the Elusive Conjunctive Consumer Decision Process," Working Paper # 31, Center for Consumer Research, University of Florida.

-----, Howard Marmorstein and Michael F. Weigold (1987), "Choices from Sets Including Remembered Brands: Use of Recalled Attributes and Prior Overall Evaluations," Working Paper # 59, Center for Consumer Research, University of Florida.

Marks, Larry J. and Jerry C. Olson (1981), "Toward a Cognitive Structure Conceptualization of Product Familiarity," in Advances in Consumer Research, 8, Kent Monroe ed., Ann Arbor, MI: Association for Consumer Research, 145-150.

Maynes, E. Scott (1978), "Informational Imperfections in Local Consumer Markets," in The Effect of Information on Consumer and Market Behavior, Andrew A. Mitchell ed., A.M.A. Proceedings Series, Chicago, IL: A.M.A., 77-85.

McConnell, J.D. (1967a), "A Behavioral Study of the Development and Persistence of Brand Loyalty for a Consumer Product," Ph.D. dissertation, Stanford University.

----- (1967b), "The Price Quality Relationship in an Experimental Setting," Journal of Marketing Research, 5, 300-303.

Mellers, B.A. and M.H. Birnbaum (1982), "Loci of Contextual Effects in Judgement," Journal of Experimental Psychology: Human Perception and Performance, 8,4,582-601.

Meyer, Robert J. (1981), "A Model of Multiattribute Judgements Under Attribute Uncertainty and Informational Constraint," Journal of Marketing Research, 18, (Nov.), 428-441.

----- (1982), "A Descriptive Model of Consumer Information Search Behavior, " Marketing Science, 1 (1), 93-121.

Miyake, Naomi and Donald A. Norman (1979), "To Ask a Question, One Must Know Enough to Know What is Not Known," Journal of Verbal Learning and Verbal Behavior, 18 (June), 357-364.

Monroe, Kent B. (1976), "The Influence of Price Differences an Brand Familiarity on Brand Preferences," Journal of Consumer Research, 3 (June), 42-49.

----- and Susan M. Petroshius (1981), "Buyers' Perceptions of Price: An Update of the Evidence," in Perspectives in Consumer Behavior, Harold H. Kassarjian and Thomas S. Robertson eds., Dallas, TX: Scott, Foresman, 43-55.

Moore, William L. and Donald R. Lehmann (1980), "Individual Differences in Search Behavior for a Nondurable," Journal of Consumer Research, 7 (December), 296-307.

Morris, Peter E., Michael M. Gruneberg, Robert N. Sykes, and Anna Merrick (1981), "Football Knowledge and the Acquisition of New Results," British Journal of Psychology, 72, 479-483.

Newman, Joseph W. and Richard Staelin (1973), "Information Sources of Durable Goods," Journal of Advertising Research, 13 (April), 19-29.

Obermiller, Carl and John J. Wheatley (1985), "Beliefs in Quality Differences and Brand Choice," in Advances in Consumer Research, 12, Elizabeth C. Hirschman and Morris Holbrook eds., Provo, UT: Association for Consumer Research, 75-78.

Olshavsky, Richard W. and Donald H. Granbois (1979), "Consumer Decision Making--Fact or Fiction?" Journal of Consumer Research, 6 (September), 93-100.

Olson, Jerry (1977), "Objective and Subjective Contextual Influences on Price Perception," in Consumer and Industrial Buying Behavior, Arch G. Woodside, Jagdish N. Sheth and Peter D. Bennett eds., New York, NY: North-Holland, 267-286.

Ostrom, T.M. and H.S. Upshaw (1968),"Psychological Perspective and Attitude Change," in Psychological Foundations of Attitude, A. Greenwald, T. Brock and T. Ostrom eds., New York, NY: Academic Press.

Parducci, A. (1965), "Category Judgement: A Range-Frequency Model," Psychological Review, 72, 407-418.

----- and L.F.Perrett (1971), "Category Rating Scales: Effects of Relative Spacing and Frequency of Stimulus Values," Journal of Experimental Psychology Monograph, 89, 427-452.

Park, C. Whan, and V. Parker Lessig (1981), "Familiarity and its Impacts on Consumer Decision Biases and Heuristics," Journal of Consumer Research, 8 (September), 223-230.

Payne, John W. (1976), "Task Complexity and Contingent Processing in Decision Making: An Information Search and Protocol Analysis," Organizational Behavior and Human Performance, 16 (August), 366-387.

Petty, Richard E. and John T. Cacioppo (1979), "Issue Involvement Can Increase or Decrease Persuasion by Enhancing Message-Relevant Cognitive Responses," Journal of Personality and Social Psychology, 37 (October), 1915-1926.

-----, -----, and David Schumann (1983), "Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement," Journal of Consumer Research, 10 (September), 135-146.

Punj, Girish N. and Richard Staelin (1983), "A Model of Consumer Information Search Behavior for New Automobiles," Journal of Consumer Research, 9 (March), 366-380.

Raju, P.S. and Michael D. Reilly (1980), "Product Familiarity and Information Processing Strategies: An Exploratory Investigation," Journal of Business Research, 8 (2), 187-212.

Rao, Vithala R. (1971), "Salience of Price in the Perception of Product Quality: A Multidimensional Measurement Approach," Proceedings of Fall Conference, Chicago: American Marketing Association, 571-577.

Riesz, Peter C. (1980), " A Major Price-Perceived Quality Study Reexamined," Journal of Marketing Research, 17 (May), 259-262.

Rothschild, Michael (1974), "Searching for the Lowest price When the Distribution of Prices is Unknown," Journal of Political Economy, 82 (July), 689-711.

Russo, J. Edward and Eric J. Johnson (1980), "What Do Consumers Know About Familiar Products," in Advances in Consumer Research, 7, Jerry C. Olson ed., Ann Arbor, MI: Association for Consumer Research, 417-423.

Sherif, C.M., M. Sherif and R.E. Nebergall (1956), Attitude and Attitude Change: The Social Judgement--Involvement Approach, Philadelphia: W.B. Saunders.

Sherif, M. and C.J. Hovland (1961), Social Judgement: Assimilation and Contrast Effects in Communication and Attitude Change, New Haven, CT: Yale University Press.

Sherman, S.J., K. Ahlm, L. Berman and S. Lynn (1978), "Contrast Effects and Their Relationship to Subsequent Behavior," Journal of Experimental and Social Psychology, 14, 340-350.

Simmons, Carolyn Jeane (1986), "Effects of Missing Information on Product Evaluations," Ph.D Dissertation, University of Florida.

Sproles, George B. (1977), "New Evidence on Price and Product Quality," Journal of Consumer Affairs, 11 (Summer), 63-77.

Srivastava, Rajendra K., Mark I. Alpert and Allan D. Shocker (1984), "A Customer-oriented Approach for Determining Market Structures," Journal of Marketing, 48 (Spring), 32-45.

Stigler, George J. (1961), "The Economics of Information," Journal of Political Economy, 69 (June), 213-25.

Tulving, Endel and Donald M. Thomson (1973), "Encoding Specificity and Retrieval Processes in Episodic Memory," Psychological Review, 80, 352-373.

Tulving, Endel and Zena Pearlstone (1966), "Availability Versus Accessibility of Information in Memory for Words," Journal of Verbal Learning and Verbal Behavior, 5, 381-391.

Tversky, Amos and Daniel Kahneman (1974), "Judgement under Uncertainty: Heuristics and Biases," Science, 185, 1124-1131.

Tyler, Sherman W. and James F. Voss (1982), "Attitude and Knowledge Effects in Prose Processing," Journal of Verbal Learning and Verbal Behavior, 21,534-538.

Valenzi, E.R. and I.R. Andrews (1971), "Effect of Price Information on Product Quality Rating," Journal of Applied Psychology, 55(1), 87-91.

Wheatley, J.J. and J.S. Chiu (1977), "The Effects of Price, Store Image and Product and Respondent Characteristics on Perceptions of Quality," Journal of Marketing Research, 14 (May), 181-186.

Wilde, L.L. (1980a), "On the Formal Theory of Inspection and Evaluation in Product Markets," Econometrica, 48 (5), 1265-1279.

----- (1980b), "The Economics of Consumer Information Acquisition," Journal of Business, 53 (3, Part 2), S143-S157.

Wilkie, William L. and Peter R. Dickson (1985), "Consumer Information Search and Shopping Behavior," Working paper, University of Florida, Gainesville.

----- and Edgar A. Pessemier (1973), "Issues in Marketing's Use of Multi-attribute Attitude Models," Journal of Marketing Research, 10 (November), 428-441.

Wyer, R.S. (1974), Cognitive Organization and Change: An Information Processing Approach, Potomac, MD: Lawrence Erlbaum Associates.

-----, and Donald Carlston (1979), Social Cognition, Inference, and Attribution, Hillsdale, NJ: Lawrence Erlbaum.

Yamagishi, Toshio, and Charles T. Hill (1981), "Adding Versus Averaging Models Revisited: A Test of a Path-Analytic Integration Model," Journal of Personality and Social Psychology, 41, 13-25.

----- and ----- (1983), "Initial Impression Versus Missing Information as Explanations of the Set-Size Effect," Journal of Personality and Social Psychology, 44, 942-951.

Zaichkowsky, Judith Lynne (1985), "Measuring the Involvement Construct," Journal of Consumer Research, 12 (December), 341-352.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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